ISCOR VANDERBIJLPARK STEEL

ENVIRONMENTAL MASTER PLAN

SPECIALIST REPORT

GEOTECHNICAL

BY

VAN RENSSEN & FORTUIN

CONSULTING ENGINEERS

SERIES IV

DOCUMENT IVS/SR/042

DECEMBER 2002

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Draft for discussion
CONFIDENTIAL
Research for IVS

ISCOR VANDERBIJLPARK STEEL

MASTER PLAN SPECIALIST REPORT: GEOTECHNICAL

DECEMBER 2002

Prepared by:
SOILKRAFT cc
For:
VAN RENSSEN & FORTUIN (Pty) Ltd
On behalf of:
OCKIE FOURIE TOXOCOLOGISTS (Pty) Ltd

ISCOR FLAT STEEL PRODUCTS VANDERBIJL PARK : PROPOSED MASTER PLAN FOR WASTE MANAGEMENT - FINAL GEOTECHNICAL REPORT

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ISCOR FLAT STEEL PROOUCTS VANDERBIJL PARK : PROPOSEO MASTER PLAN FOR WASTE MANAGEMENT – FINAL GEOTECHNICAL REPORT

1 APPOINTMENT

Soilkraft cc was appointed by Mr C van Renssen of Van Renssen and Fortuin Consulting Engineers to assist them with the assessment of the geotechnical conditions at various places in the existing site of the Iscor works at Vanderbijl Park. The report serves the purpose to allow an input to the development of a master plan for pollution control at the existing premises and deals specifically with shallow geotechnical conditions and soil characteristics.

2 EXTENT OF THE REPORT

This document is issued as a report to provide a geotechnical input to the proceedings of the total investigation. The areas covered are :

- The existing waste site.
- The site for the proposed new dams.
- The proposed new waste site.
- The existing dams.
- The north western and south eastern perimeter areas.
- The Cyferpan and farmlands areas.

The emphasis of the investigation varied for various parts of the site, but in general it was aimed at :

- Determining the susceptibility of the soil profile to pollution.
- Determining the presence of pollutants in the soil profile.
- Determining the suitability of in situ soil materials for the construction of various types of earthworks.

3 METHOD OF INVESTIGATION

The field work for the investigation was undertaken in the period 11 March 2002 to 25 March 2002. It consisted of the following :

3.1 Test Pitting

Sixty six test pits were excavated with a Caterpillar 416 TLB on hire from Vuma Construction in the various areas as required and where the sites were accessible to the equipment. The test pits were profiled according to the standard profiling parameters as proposed by the Geotechnical Division of SAECI and SAIEG. For easy reference these parameters are summarized in the attached Table 1 : Soil Descriptive Terms The test pit profiles are contained in Addendum A to this report.

3.2 Auger Drilling

Eleven auger holes were drilled to various depths across the site with a Williams 11 digger on hire from Soiltech. As this type of investigation is extremely expensive, the drilling was limited to the minimum and only areas considered important were investigated. The auger hole profiles are contained in Addendum B to this report.

3.3 DSH Probing

Fifty six sites were probed with a DSH probe provided by Mr Roelf Fourie. The aim of the probing was to act as an infill to the test pitting to obtain an indication of depth to bedrock. The results of the probing are contained in Addendum C to this report.

3.4 Soil Testing

The purpose of soil testing in general was :

- To obtain information regarding the suitability of the available materials for future construction of liners, earth embankments etc.
- To determine the permeability of certain materials and hence the susceptibility there of to become polluted.

The results of the soil testing are contained in Addendum D to this report.

TABLE 1 : SOIL DESCRIPTIVE TERMS

CONSISTENCY : GRANULAR SOILS

SPT N	GRAVELS & SANDS Generally free draining soils		DRY DENSITY (kg/m^3)
<4	Very loose	Crumbles very easily when scraped with geological pick	<1450
4-10	Loose	Small resistance to penetration by sharp pick point	1450-1600
10-30	Medium dense	Considerable resistance to penetration by sharp pick point	1600-1750
30-50	Dense	Very high resistance to penetration by sharp pick point, requires many blows by pick point for excavation.	1750-1925
>50	Very dense	High resistance to repeated blows of geological pick. Requires power tools for excavation.	>1925

CONSISTENCY : COHESIVE SOILS

SPT N	SILTS & CLAYS and combinations with SANDS. Generally slow draining soils		UCS (kPa)
<2	Very soft	Pick point easily pushed in 100mm Easily moulded by fingers	<50
2-4	Soft	Pick point easily pushed in 30mm to 40mm Moulded by fingers with some pressure	50-125
4-8	Firm	Pick point penetrates to 10mm Very difficult to mould with fingers	125-250
8-15	Stiff	Slight indentation by pick point. Cannot be moulded by fingers. Penetrated by thumb nail.	250-500
15-30	Very stiff	Slight indentation by blow of pick point. Requires power tools for excavation.	500-1000

SOIL TYPE

SOIL TYPE	PARTICLE SIZE(mm)
Clay	<0,002
Silt	0,002-0,06
Sand	0,06-2,0
Gravel	2,0-60,0
Cobbles	60,0-200,0
Boulders	>200,0

MOISTURE CONDITION

Dry	No water detectable
Slightly moist	Water just discernable
Moist	Water easily discernable
Very moist	Water can be squeezed out
Wet	Generally below water table

COLOUR

Speckled	Very small patches of colour <2mm
Mottled	Irregular patches of colour 2-6mm
Blotched	Large irregular patches 6-20mm
Banded	Approximately parallel bands of varying colours
Streaked	Randomly orientated streaks of colour
Stained	Local colour variations : Associated with discontinuity surfaces

SOIL STRUCTURE

Intact	No structure present
Fissured	Presence of discontinuities, possibly cemented
Slickensided	Very smooth, glossy, often striated discontinuity planes
Shattered	Presence of open fissures. Soil break into gravel size blocks.
Micro shattered	Small scale shattering, very closely spaced open fissures. Soil breaks into sand size crumbs.
Residual structures	Residual bedding, laminations, foliations,etc.

ORIGIN

Transported	Alluvium, mifwash, talus, etc
Residual	Weathered from parent rock, eg residual granite
Pedocretes	Ferricrete, silcrete, calcrete etc.

DEGREE OF CEMENTATION OF PEDOCRETES

TERM	DESCRIPTION	UCS (MPa)
Very weakly cemented	Some material can be crumbled between finger and thumb. Disintegrates under knife blade to a friable state	0,1-0,5
Weakly cemented	Cannot be crumbled between strong fingers. Some material can be crumbled by strong pressure between thumb and hard surface. Under light hammer blows disintegrate to a friable state.	0,5-2,0
Cemented	Material crumbles under firm blows of sharp pick point. Grains can be dislodged with some difficulty by a knife blade.	2,0-5,0
Strongly cemented	Firm blows of sharp pick point on hand-held specimen show 1-3mm indentations. Grains cannot be dislodged by knife blade.	5,0-10,0
Very strongly cemented	Hand-held specimen can be broken by single firm blow of hammer head. Similar appearance to concrete.	10,0-25

4 REGIONAL GEOLOGY

The area is covered by lithology belonging to the Transvaal Sequence, consisting of various shales, quartzitic sandstones and lavas. Most of the constituent beds have been subjected to folding and faulting and their thicknesses and delineation vary considerably. The area is situated on the

perimeter of the so-called Vredefort dome, and, on a large scale, a dome-like circular distribution of the stratigraphy can be identified. This phenomenon consists of a large scale synclinorium, which curves round the Vredefort Dome, and is known as the Vereeniging Dome.

The lithology of the area is intruded by sills of diabase associated with the Bushveld Complex. The width and distribution of these sills are highly variable and can be considered the dominating geological feature of the area.

Surface deposits of recent origin cover the entire site, although the thickness and composition there of vary considerably. In areas where shale is encountered at shallow depths, the soil cover tends to be argillaceous. Towards the south fine, light red, wind blown deposits of sand are present. However, the most important soil type is recently gravels of degradation present over large areas of the site. These gravels consist of cobbles and boulders of various materials embedded in ferruginous soils. Among the cobbles and boulders are chert, conglomerate and quartz. Some of the boulders attain a diameter of up to 1000mm.

The regional geology of the site is indicated on the attached Figure 1 : Regional Geology.

5 DISCUSSION

5.1 Existing Waste Site

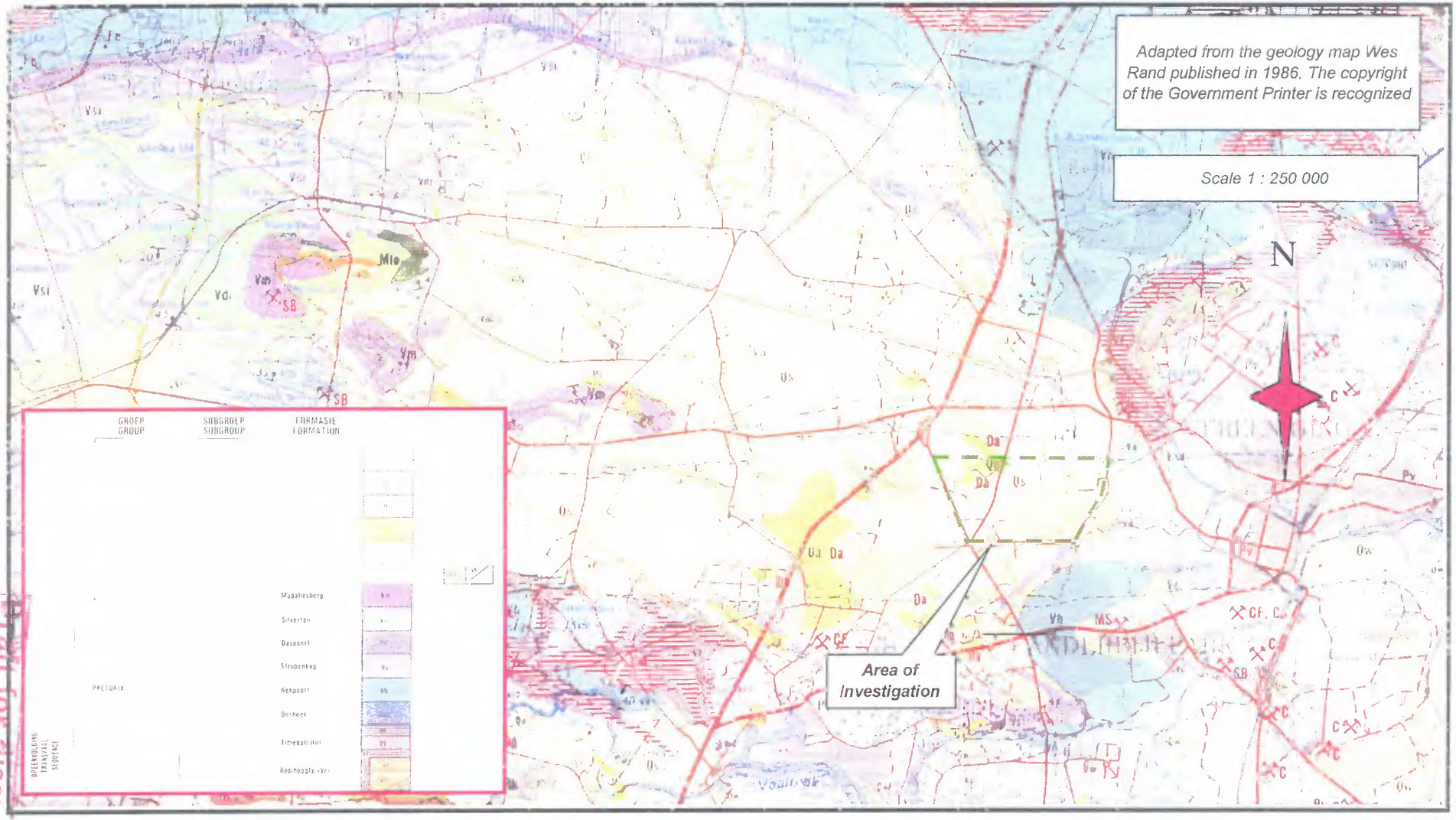
The existing waste site was investigated by means of DSH probes 1 to 10. The probe curves are indicated on Figures C1 to C10 contained in Addendum C to this report.

The aim of the investigation was to determine whether there is a perched watertable present in the area. Probing is an inexpensive method of investigation, and it was considered to be a bonus if a watertable could be encountered and a piezometer installed. However, due to the composition of the waste materials, only limited penetration was possible and refusal generally occurred between 600mm and 5100mm deep without encountering any perched water.

5.2 Proposed New Dam Site

This area was investigated by means of :

- Eleven test pits as per Figures A1 to A11 contained in Addendum A to this report.
- DSH probes 25 to 38 as per Figures C25 to C38 contained in Addendum C to this report.



SOIL KRAFT

REGIONAL GEOLOGY

FIGURE 1

5.2.1 *Geology*

Bedrock occurs typically as grey to brown Silverton shale. Bedrock was encountered at depths from 1500mm and deeper. Towards the north, in the areas of test pits 9, 10 and 11, intrusions of diabase cut through the shale and alternating occurrences there of occur in narrow bands, striking east to west.

5.2.2 *Pedology*

The soil profile consists typically of a surface horizon of transported sand, 200mm to 600mm thick, overlying residual silts and clays. Towards the south in the area where bedrock of shale occurs, the residual soils are generally of silty composition. Towards the north where a constant source of parent rock is not available, the material differs considerably from clays to silts. Ferruginization in the upper horizons of the clay and lower horizons of the transported material is common.

5.2.3 *Material Properties*

- *Potential Expansivesness* : The materials derived from the weathering of diabase must be regarded as moderately expansive with clay content of approximately 30%. Typically sandy clays and clayey sands have developed from the weathering of parent rock. The materials derived from the weathering of shale must be regarded as slightly expansive with a clay content of less than 10%. Typically sandy silts and clayey sands have developed from the weathering of parent rock.
- *Permeability* : Laboratory determined material permeabilities vary between 1,1 X 10^{-5}cms^{-1} and 5,0 X 10^{-6}cms^{-1}. Calculated material permeabilities based on the material grading characteristics, vary between 8,12 X 10^{-4}cms^{-1} and 6,11 X 10^{-7}cms^{-1}. Results of in situ seepage tests in three test pits indicated a rate of seepage varying between 0mm per hour to 1,9mm per hour.
- *Shear Characteristics* : The results of shear tests indicate the materials to be cohesionless, with a peak angle of internal friction varying between 30,7° and 38,8°.

5.2.4 *Material Excavitibility*

Refusal of excavation occurred at depths between 2000mm and 3000mm. Refusal of probing occurred between 1500mm and 4500mm. A pattern of depth to refusal can not be established, as it is material source dependent. It was possible to excavate all soils with a TLB, but the clays in test pits 9 to 11 were very stiff and refusal of excavation took place in the clay horizon.

5.2.5 *Perched Groundwater*

No groundwater seepage or visible or odorous conditions of pollution were encountered.

5.2.6 Conditions of Pollution

Visible signs of pollution or odorous soils and waters were not encountered.

5.3 Proposed New Waste Site

This area was investigated by means of :

- Seven test pits as per Figures A12 to A18 contained in Addendum A to this report.
- One auger hole as per Figure B4 contained in Addendum B to this report.

5.3.1 Geology

Bedrock of shale was encountered in the auger hole only at a depth of 4800mm. Material properties of the residual soils encountered in most of the test pits indicate the area to be predominantly located on shale. However, the thick deposit of clay encountered in test pit 3 suggests the possible presence of a diabase intrusion.

5.3.2 Pedology

The pedology of the area is highly variable, consisting of a surface horizon of fill or silty sand overlying the pebblestone marker and residual clays and silts. The clays and silts are the products of weathering of either Silverton shale or diabase. Isolated areas of gravels of degradation were also encountered. Ferruginization of both the pebblestone marker and the residual soil is common. Perhaps the most important pedological feature of the area is the presence of the well developed and often ferruginized pebblestone marker.

5.3.3 Material Properties

- *Potential Expansivesness* : The materials derived from the weathering of shale must be regarded as slightly to moderately expansive with a clay content between 11% and 21%. Typically sandy silts to sandy clays have developed from the weathering of parent rock.
- *Permeability* : Laboratory determined material permeabilities of the residual soil vary between 6,7 X 10^{-4}cms^{-1} and 1,1 X 10^{-5}cms^{-1}. Calculated material permeabilities based on the material grading characteristics, vary between 1,6 X 10^{-4}cms^{-1} and 7,8 X 10^{-7}cms^{-1}. The presence of water in the test pits excluded the determination of in-situ permeability properties of the soil. The presence of water in the pebblestone marker indicates this horizon to be highly permeable.

5.3.4 Material Excavitibility

Refusal of excavation with the TLB usually took place between 1800mm and 3100mm. The auger hole refused at 5000mm on medium hard rock, shale. Conditions of excavation in both the shale and gravels of degradation can be regarded as hard. Soils can be regarded as soft excavation. Although it was difficult to penetrate the ferricrete with the TLB, it can still be regarded as removable by mechanical means. Conditions of excavation are greatly impeded by the presence of shallow perched water.

5.3.5 Perched Ground Water

Perched ground water was found to be present throughout the area. Several layers of perched water are present ; usually an extremely strong one within the highly permeable pebblestone marker and transported material, and a second just above bedrock. In test pit 6 (figure A17), the inflow of water was so strong that the test pit overflowed while excavation was in progress. The excavation and inspection of several pits had to be abandoned due to the influx of water and collapsing side walls.

5.3.6 Conditions of Pollution

No visible signs of pollution could be detected.

5.4 Existing Dam Site

This area was investigated by means of :

- Ten test pits as per Figures A19 to A28 contained in Addendum A to this report.
- Two auger holes as per Figures B5 and B6 contained in Addendum B to this report.
- DSH probes 11 to 24 as per Figures C11 to C24 contained in Addendum C to this report.

5.4.1 Geology

The eastern parts of the area are located on quartzite of the Daspoort Formation, but to the west a well developed diabase intrusion is present. The quartzite occurs as very hard rock, light red to light purple quartzitic sandstone. The diabase is deeply weathered and bedrock was not encountered at all. The structure of the residual diabase derived soil confirms the origin there of.

5.4.2 Pedology

The pedology of the area is highly variable, consisting of a surface horizon of silty sand overlying Daspoort quartzites at very shallow depths in the east, to quaternary gravels and ferricrete overlying

diabase in the west. The residual diabase consists of yellowish, relic jointed sandy silts and is present to great depths.

The area immediately adjacent to the dams has been used as a borrow pit to obtain construction material for the damwalls. Especially the ferricrete and quaternary gravels have been removed for this purpose. The total effect is thus that over large parts the residual diabase has come in direct contact with seepage water from the dams.

5.4.3 Material Properties

- *Potential Expansiveness* : The materials derived from the weathering of diabase must be regarded as moderately expansive with a clay content of 29%. The pebblestone marker consists predominantly of gravels in a sand matrix and contains only 2% clay. It must therefore be regarded as non-expansive.
- *Permeability* : A laboratory determined material permeability on the residual diabase soil indicate the coefficient of permeability to be 3,7 X 10^{-5}cms^{-1}. The calculated material permeability of the residual diabase, based on the material grading characteristics, is 2,4 X 10^{-7}cms^{-1} ; while the calculated permeability coefficient of the pebblestone marker is 3,04cms^{-1}. The presence of water in the test pits excluded the determination of in-situ permeability properties of the soil.

5.4.4 Material Excavitibility

Refusal of excavation with the TLB usually took place between 900mm and 2600mm : In the east on hard rock, quartzite and in the west on quaternary gravels or very dense ferricrete. . The auger holes refused at 12700mm and 18000mm respectively in the diabase. Refusal of probing took place between 1200mm (on ferruginized gravels) and 10500mm in the diabase. Conditions of excavation in the ferricrete, quartzitic sandstone and gravels of degradation can be regarded as hard. Soils can be regarded as soft excavation. Conditions of excavation are greatly impeded by the presence of shallow perched water.

5.4.5 Perched Groundwater

Perched ground water was found to be present throughout the area. Several layers of perched water are present ; usually an extremely strong one within the highly permeable pebblestone marker and transported material, and a second just above the dense ferricrete or on top of the less permeable residual diabase soil. bedrock. The excavation and inspection of several pits had to be abandoned due to the influx of water and collapsing side walls.

5.4.6 Conditions of Pollution

Tar is visibly present in the arenaceous surface soils, especially the pebblestone marker which acts as a preferential zone of seepage. Tar is also visible in the relic joints of the weathered diabase. The perched water and the weathered diabase encountered in the auger holes up to refusal smelt strongly of tar.

5.5 North Western Perimeter

This area was investigated by means of :

- Eleven test pits as per Figures A29 to A39 contained in Addendum A to this report.
- Four auger holes as per Figures B7 to B10 contained in Addendum B to this report.
- DSH probes 39 to 47 as per Figures C39 to C47 contained in Addendum C to this report.

5.5.1 Geology

This area is located on a well defined diabase intrusion and bedrock of diabase was encountered at depth in auger holes 7, 8 and 10. It is possible that more than one intrusion is present in the area, with the rock infills between the diabase consisting of shale.

5.5.2 Pedology

The pedology of the area consists mostly of clays and silts derived from the weathering of diabase and shale. Isolated occurrences of hardpan ferricrete are present. The materials can be considered as highly impermeable.

5.5.3 Material Excavitibility

Refusal of excavation with the TLB usually took place between 1100mm on ferricrete or excavation continued up to a depth of 3200mm in the clay. The auger holes refused between 3400mm and 6000mm. Refusal of probing took place between 300mm (on ferruginized gravels) and 10500mm in the clay. Excavation in the clays and silts can be regarded as soft. The ferricrete was much harder, but it will still be possible to remove it with heavy excavation equipment.

5.5.4 Perched Groundwater

Perched water was encountered locally and at depth only. Due to the impermeable soil profile, surface water is more common.

5.5.5 Conditions of Pollution

No visible signs of pollution were encountered.

5.6 South Eastern Perimeter

This area was investigated by means of :

- Three test pits as per Figures A40 ; A41 and A47 contained in Addendum A to this report.
- Two auger holes as per Figures B3 and B11 contained in Addendum B to this report.
- DSH probes 54 to 56 as per Figures C54 to C56 contained in Addendum C to this report.
- The investigation of the area was reduced due to the presence of several buried services in the area.

5.6.1 Geology

Bedrock in the area is covered by a horizon of very dense, quaternary gravels. It is presumed that these gravels overlie Timeball Hill shales.

5.6.2 Pedology

The pedology of the area consists of colluvial sand overlying a very dense horizon of ferruginized quaternary gravels.

5.6.3 Material Excavitibility

Refusal of excavation with the TLB usually took place between 1600mm and 2600mm in the gravels. The auger holes refused between 2700mm and 3000mm in the gravels. Refusal of probing took place between 1800mm and 2700mm in the gravels.

5.6.4 Perched Groundwater

Perched groundwater is present just above the ferruginized quaternary gravels and within the horizon of gravel itself. Although these gravels are impenetrable by the mechanical investigative procedures, the are not impervious, and seepage took place through and above them.

5.6.5 Pollution

No visible signs of pollution were encountered in the area.

5.7 Southern Perimeter

This area was investigated by means of :

- Five test pits as per Figures A42 to A46 contained in Addendum A to this report.
- Two auger holes as per Figures B1 to B2 contained in Addendum B to this report.
- DSH probes 48 to 51 as per Figures C48 to C51 contained in Addendum C to this report.
- The investigation of the area was reduced due to the presence of several buried services in the area.

5.7.1 Geology

An intrusion of diabase is encountered in the western part of the site, while hard rock, quartzitic sandstone is present in the east. The diabase was encountered at a depth of 5200mm in auger hole 1. The sandstone was encountered at a depth of 500mm in test pit 17 of the perimeter test pits.

5.7.2 Pedology

The pedology of the area consists of a transitional zone from the argillaceous clays and silts derived from diabase in the west, to arenaceous soils and gravels derived from Daspoort quartzite in the south. Residual clays were thus predominantly encountered in the west and thick surface deposits of sands in the south east. The clays can be regarded as moderately impermeable, but the sands as highly permeable.

5.7.3 Material Excavitibility

Refusal of excavation with the TLB usually took place between 800mm on quartzite and 2900mm in the clay. The auger holes refused between 1600mm and 5800mm. Refusal of probing took place between 1200mm on quartzitic sandstone and 3900mm in the sand.

5.7.4 Perched Groundwater

Perched water is quite common in the area, consisting of water usually present above bedrock.

5.7.5 Pollution

Recognizable pollution was encountered in test pit 17 (Figure A45) due to the strong smell of ammonia originating from the perched water.

5.8 Cyferpan and Farmlands Area

These areas were investigated by means of 19 test pits excavated with a TLB. The profiles are contained in Addendum A to this report. Extensive soil testing was undertaken to obtain indications of the suitability of the soil material for future utilization. The results of the soil testing are contained in Addendum D to this report.

5.8.1 Geology

The geology of the area consists of shale intruded by diabase sills and dykes. A deep soil profile is present on site and bedrock was not encountered in any of the test pits.

5.8.2 Pedology

The soil profile consists typically of a surface horizon of transported silty to clayey sand overlying residual clays and silts. The surface horizon of sand was between 450mm and 1500mm thick in the test pits. Residual clays and silts are derived from the weathering of diabase and shale. Ferruginization of the residual soil is common. The soil quality is dependent on the extent of ferruginization of the soil profile, rather than on the parent rock.

5.8.3 Material Properties

- *Potential Expansivesness* : All materials must be regarded as potentially moderately to highly expansive. The only limiting factor in this regard is the proportion of shale or ferricrete gravels contained in the soil matrix. In general the argillaceous materials have a clay content between 22% and 32% ; and the gravelly materials a clay content between 4% and 10%.
- *Permeability* : Laboratory determined material permeabilities vary between 6,7 X 10^{-5}cms^{-1} and 4,70 X 10^{-8}cms^{-1} for the argillaceous soils, and 1,6 X 10^{-3}cms^{-1} and 1,7 X 10^{-3}cms^{-1} for the gravelly soil. Calculated material permeabilities based on the material grading characteristics, vary between 1,07 X 10^{-4}cms^{-1} and 8,9 X 10^{-8}cms^{-1} for the argillaceous soils, and 1,7 X 10^{-2}cms^{-1} and 4,0 X 10^{-2}cms^{-1} for the gravelly soil.
- *Shear Characteristics* : The results of shear tests indicate the argillaceous materials to be cohesionless, with a peak angle of internal friction of 14,9° ; and the cohesion of the gravelly soil to vary between 5,4kNm^{-2} and 6,3kNm^{-2}, while the peak angle of internal friction varies between 30,2° and 43,5°.

5.8.4 Material Excavitibility

In 15 of the 19 test pits excavated for the survey in this area, it was possible to penetrate past a depth of 2500mm without encountering refusal of excavation. In test pits 14, 15, 16 and 18 refusal of

excavation was encountered shallower than 2000mm on hard rock, shale. These test pits are all located in the western parts of the farmlands area.

5.8.5 Perched Groundwater

The presence of surface water, especially in the Cyferpan area, is common. Perched water occurs generally throughout the area and was encountered at depths usually deeper than 2500mm.

5.8.6 Pollution

No discernable signs of pollution were encountered.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Existing Waste Site

If it is important to obtain information regarding depth to ground water in this area, it can be done, but at a cost. More expensive methods such as continuous flight augering or core drilling can be considered, but whether the cost to obtain such information is really worthwhile, is a question that should be addressed first.

6.2 New Dams

The materials present in this area vary according to origin. Towards the north it is more clayey and towards the south more silty. With selection and a more detailed investigation, the area can be divided into zones of materials suitable for impermeable liners or capping. When considering the use of this area for dam construction, cognizance must be taken of the fact that excavation will be limited due to the presence of rock at fairly shallow depths, especially in the southern part there of.

6.3 New Waste Site

From the vegetation and presence of perched ground water in especially the highly permeable transported soil and pebblestone marker, it appears as if this area may originally have been part of a wetland. Th effect of this must be taken into account when considering the establishment of a waste site here.

6.4 Existing Dams

The existence of these dams is a fact that must be accepted as part of the scenario. However, it is important to realize that visual signs of pollution are present in the transported soil and pebblestone

marker ; impermeable materials serving as a natural barrier between the dams and the environment have been removed for construction, and the contents of the dam are in contact with residual diabase. In the given hydro geological scenario the diabase serves as an aquifer and the contents of the dam can come in contact with the permanent ground water. A strong smell of tar in the residual soil was encountered up to 18000mm deep.

6.5 Perimeter Areas

Apart from the south eastern comer, the perimeter areas investigated appear to be fairly free of pollution and not really susceptible to pollution. However, in the south eastern corner of the site, soils occur as thick deposits of sand and sandstone. These materials do not serve as barriers limiting the progress of any water borne materials. Discernable signs of pollution were thus encountered in this area.

6.6 Cyferpan and Farmland Areas

It is believed that the Cyferpan area is too wet to develop as a borrow pit for the future construction. The farmlands area may be set aside for this purpose, but detailed soils investigations are required to delineate the argillaceous and gravelly materials. The suitability of this area is again limited by the presence of water at fairly shallow depths.

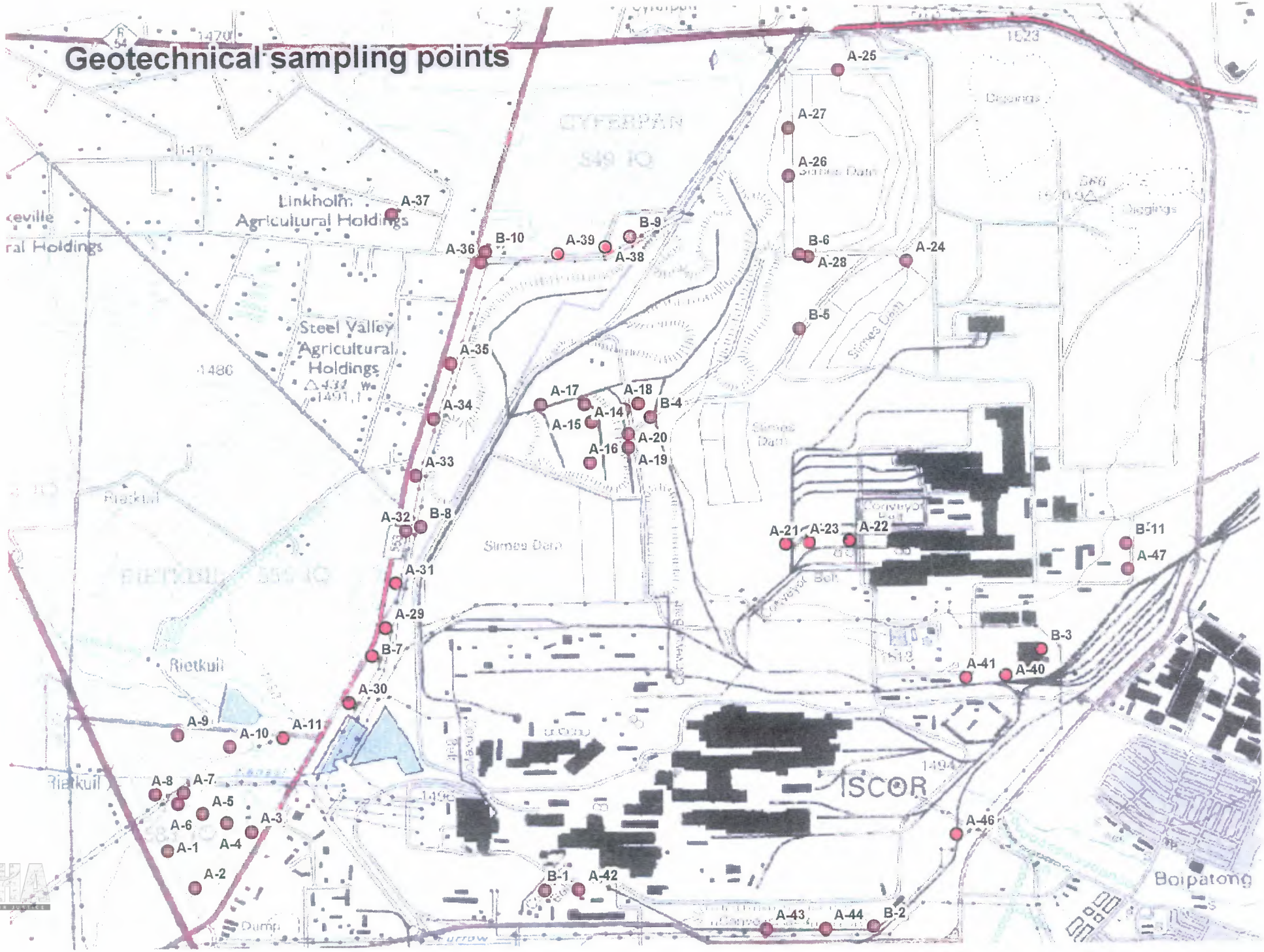
FJ Breytenbach, Pr Eng
For Soilkraft cc

9 May 2002

ISCOR FLAT STEEL PRODUCTS VANDERBIJL PARK : PROPOSED MASTER PLAN FOR WASTE MANAGEMENT - FINAL GEOTECHNICAL REPORT

7 ADDENDUM A

TEST PIT PROFILES


Geotechnical sampling points
A-25
A-27
A-26
A-37
B-9
A-36
B-10
A-39
A-38
B-6
A-28
A-24
B-5
A-35
A-34
A-17
A-18
B-4
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A-15
A-20
A-16
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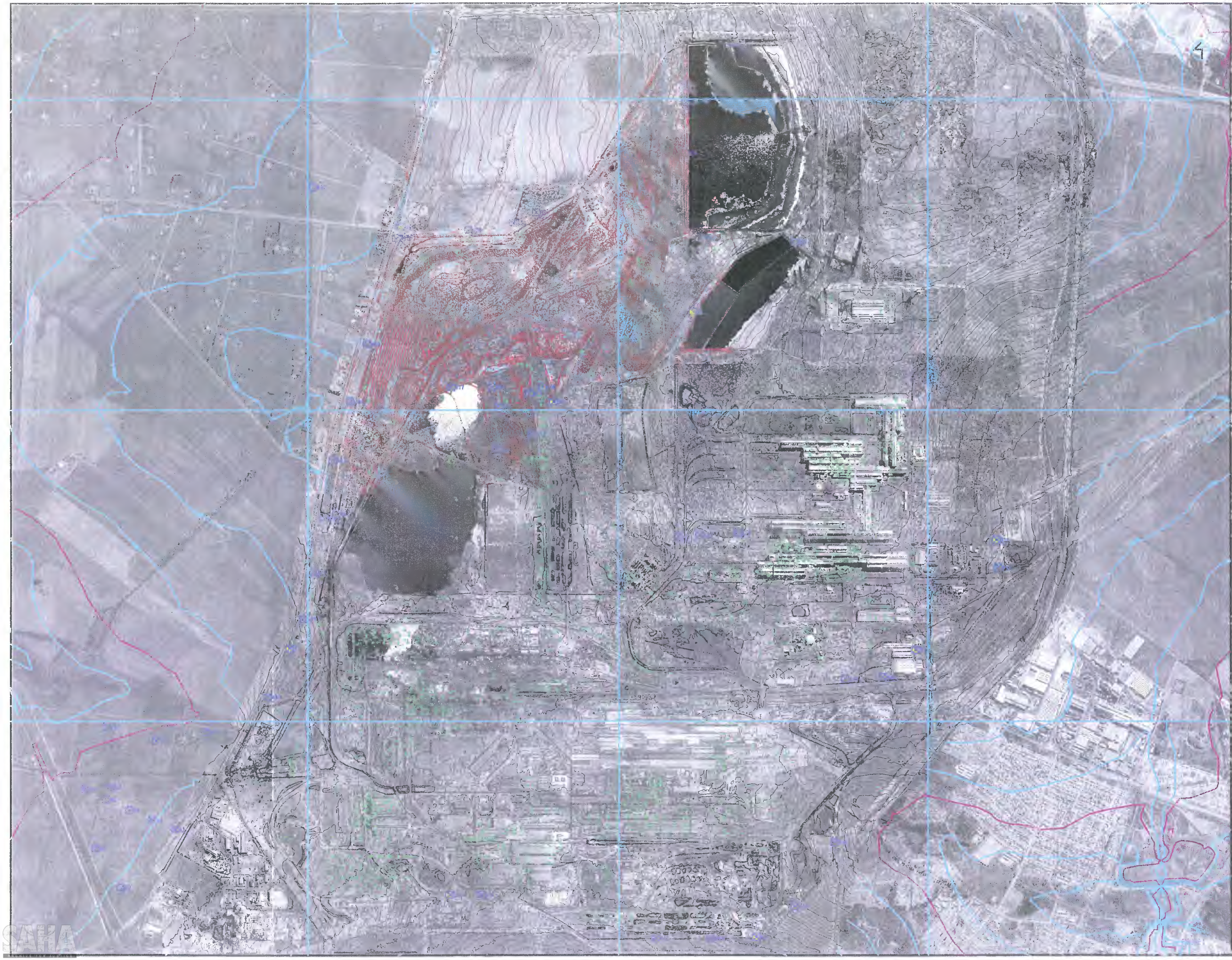
A-33
A-32
B-8
A-21
A-23
A-22
B-11
A-47
A-31
A-29
B-7
B-3
A-41
A-40
A-30
A-9
A-10
A-11
A-8
A-7
A-5
A-6
A-3
A-4
A-1
A-2
A-46
B-1
A-42
A-43
A-44
B-2
Linkholm Agricultural Holdings
Steel Valley Agricultural Holdings
Rietkuil
ISCOR
Boipatong
Slimes Dam



CLIENT

ISCOR flat steel

NOTES:
CO-ORDINATE SYSTEM ACCORDING TO ISCOR LOCAL GRID (BLACK)
Lo 29 (LIGHT BLUE)

EXISTING GEOTECHNICAL PROFILES
MASTER PLAN AUGER HOLES
MASTER PLAN TEST PITS

Draft for discussion
CONFIDENTIAL
Research for IWS

OCKIE FOURIE
TOKSIKOLOË (EDMS) BPK
TOXICOLOGISTS (PTY) LTD

PROJECT
ISCOR
VANDERBIJLPARK STEEL:
MASTER PLAN

DRAWING TITLE
GEOTECHNICAL

DATE NOVEMBER 2002

SCALE 1 : 7 500

VAN RENSSEN & FORTUIN
CONSULTING ENGINEERS
RAADGEWENDE INGENIEURS
BAGAKOLODI BA DIENJENERE

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CVR .... DESIGNED	GBS .... CHECKED
JvdW .... DRAWN	AO .... CHECKED

APPROVED FOR CONSTRUCTION
PR. ENG. / PR. TECH. ENG. DATE

DRAWING No.
FIGURE 1 A

CLIENT APPROVAL
SIGNATURE
NAME: DATE:

FOR INFORMATION A3

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	1
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 40' 05,6" S 27° 47' 22,6" E

SHEET No: / Vel Nr: 1

DATE: / DATUM: 23 March 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Sample / Monster
	0,30	Slightly moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.
	0,50	Slightly moist, light yellow grey mottled light brown, loose, intact, silty ***SAND*** and matrix supported, rounded, black, ferricrete concretions. Ferruginized pebblestone marker.
	1,00	Slightly moist, light yellow mottled light brown, medium dense, ferruginized, clayey ***SAND*** and matrix supported, fine, subrounded, gravels of ferricrete. Ferruginized residual shale.
	1,50	Moist, light brown stained black on discontinuities, firm, relic jointed, clayey ***SILT***. Residual shale.
	2,20	Light brown mottled black on fractures, very closely fractured, very fine grained, slightly weathered, soft rock, ***SHALE***. Discontinuities are closed, smooth and clean.

Water encountered Water teëgekom	
Water level Waterrusvlak	
Bottom of hole Bodem van gat	
Approximate material change Benaderde materiaalverandering	
Disturbed sample Versteurde monster	
Undisturbed sample Onversteurde monster	
Consolidation sample Konsolidasie monster	C
Indicator tests Klassifikasie toets	I

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Excavation terminated at 2200mm due to slow progress.

2 No seepage encountered.

SOIL KRAFT	SOIL PROFILE : TEST PIT 1	FIG A1

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	2
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 40' 13,7" S 27° 47' 28,5" E
SHEET No: / Vel Nr:	1	DATE: / DATUM:	23 March 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Description	Sample / Monster
	0,30	Slightly moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.	
	0,60	Slightly moist, light yellow grey mottled light brown, loose, intact, silty ***SAND*** and matrix supported, rounded, black, ferricrete concretions. Ferruginized pebblestone marker.	
	0,80		
	1,40	Light yellow brown mottled dark red and black, dense, hardpan ***FERRICRETE***. Pedogenetic deposits.	
		Slightly moist, light grey mottled light brown and black, stiff, ferruginized, sandy ***SILT*** and matrix supported, medium coarse, subrounded, gravels of ferricrete. Residual shale.	
	2,20	Slightly moist, light yellow mottled black, stiff, relic jointed, sandy ***SILT*** and matrix supported, fine, rounded, black, ferricrete concretions. Residual shale.	● Lab no 4594

▽	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
	Bottom of hole / Bodem van gat
- - -	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
▮	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests / Klassifikasie toets

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Excavation terminated to facilitate percolation test.

2 No seepage encountered.

3 No percolation encountered at bottom of the test pit in standard percolation test.

SOIL KRAFT

SOIL PROFILE : TEST PIT 2

FIG A2

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	3	SHEET No: Vel Nr:	1
SITE: TERREIN:	Proposed New Dam Site	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	25 March 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 40' 01,6" S 27° 47' 40,9" E		

SOIL PROFILE - GRONDPROFIEL

Depth / Diepte (m)	Description	Sample / Monster
0 – 0,30	Slightly moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.	
0,30 – 0,90	Slightly moist, dark yellow, loose, intact, silty ***SAND***. Fine colluvium.	
0,90 – 1,70	Slightly moist, pale light grey mottled dark yellow, stiff, intact, clayey ***SILT*** and matrix supported, fine subrounded, black ferricrete concretions. Residual shale.	
1,70 – 2,40	Slightly moist, light brown mottled black, light grey and dark red brown, stiff to very stiff, cemented, clayey ***SILT***. Residual shale.	

Symbol	Legend
▽	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
⊔	Bottom of hole / Bodem van gat
---	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests / Klassifikasie toets

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	4 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Excavation terminated at 2400mm due to slow progress.

2 No seepage encountered.

SOIL KRAFT

SOIL PROFILE : TEST PIT 3

FIG A3

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 4	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 25 March 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 39' 59,6" S 27° 47' 35,6" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m		Sample / Monster
	0,30	Moist, light grey brown, loose, intact, silty ***SAND***. Fine colluvium.	
	0,60	Moist, light brown, soft, intact, sandy ***CLAY***. Reworked residual shale.	
	0,90	Moist, light grey, soft, intact, sandy ***CLAY***. Reworked residual shale.	
		Slightly moist, pale light grey, firm, intact, sandy ***CLAY*** and matrix supported, fine, rounded, black, ferricrete concretions. Residual shale.	● Lab no 4595
	1,90	Pale light grey mottled light yellow green stained black, very closely fractured, very fine grained, highly weathered, very soft rock, ***SHALE***. Discontinuities are open, smooth and clean.	
	2,20		
	2,60	Pale light brown mottled light grey, very closely fractured, very fine grained, moderately weathered, soft rock, ***SHALE***. Discontinuities are open, smooth and clean.	

▽	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
	Bottom of hole / Bodem van gat
---	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests / Klassifikasie toets

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Excavation terminated at 2600mm due to slow progress.

2 No seepage encountered.

SOIL KRAFT	SOIL PROFILE : TEST PIT 4	FIG A4

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	5
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 39' 57,6" S 27° 47' 30,3" E
SHEET No: / Vel Nr:	1	DATE: / DATUM:	25 March 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Sample / Monster
	0,30	Moist, light grey brown, loose, intact, silty ***SAND***. Fine colluvium.
	1,70	Slightly moist, light grey, firm, intact, sandy ***CLAY***. Residual shale.
	2,50	Slightly moist, pale light grey mottled dark yellow, firm, intact, sandy ***SILT***. Residual shale.
	3,00	Pale light brown mottled light grey, very closely fractured, very fine grained, moderately weathered, soft rock, ***SHALE***. Discontinuities are open, smooth and clean.

▽	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
	Bottom of hole / Bodem van gat
---	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests / Klassifikasie toets

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Excavation terminated at 3000mm due to slow progress.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 5**	**FIG A5**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 6	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 25 March 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 39' 55,4" S 27° 47' 24,9" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
	0,30	Moist, light grey brown, loose, intact, silty ***SAND***. Fine colluvium.	
	1,10	Slightly moist, light grey, firm, intact, sandy ***CLAY***. Residual diabase.	
	2,50	Slightly moist, pale light grey mottled dark yellow, firm, intact, sandy ***SILT***. Residual diabase.	Lab no 4596
	2,70	Slightly moist, pale light grey, very stiff, intact, sandy ***CLAY*** and matrix supported, fine, rounded, black, ferricrete concretions. Residual diabase.	

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
Consolidation sample / Konsolidasie monster	C
Indicator tests / Klassifikasie toets	I

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Excavation terminated at 2700mm due to slow progress.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 6**	**FIG A6**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 7	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 27 March 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 39' 53,0" S 27° 47' 26,2" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m		Sample / Monster
	0,30	Moist, light grey brown, loose, intact, silty ***SAND***. Fine colluvium.	
	1,60	Slightly moist, light grey, firm, intact, sandy ***CLAY***. Residual diabase.	
	2,00	Slightly moist, pale light grey mottled dark yellow, firm, intact, sandy ***SILT***. Residual diabase.	
	2,20	Slightly moist, pale light grey, firm, intact, sandy ***CLAY*** and matrix supported, fine, rounded, black, ferricrete concretions. Residual diabase.	

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
Consolidation sample / Konsolidasie monster	C
Indicator tests / Klassifikasie toets	I

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 No seepage encountered.

3 Rate of seepage in standard percolation test at bottom of the hole = 1,9mm per hour.

SOIL KRAFT	SOIL PROFILE : TEST PIT 7	FIG A7

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 8	SHEET No: Vel Nr: 1
SITE: TERREIN:	Proposed New Dam Site	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 27 March 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE: 26° 39' 53,3" S 27° 47' 20,0" E	

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
	0,90	Slightly moist, light grey, firm, intact, sandy ***CLAY***. Residual diabase.	
	1,30	Slightly moist, light yellow grey, firm, intact, sandy ***CLAY***. Residual diabase.	
	2,70	Slightly moist, pale light grey, firm, slickensided, clayey ***SILT*** and matrix supported, subangular, coarse, soft, white, calcereous concretions. Residual diabase.	

Symbol	Legend
▽	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
⊔	Bottom of hole / Bodem van gat
---	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
▮	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests / Klassifikasie toets

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	4 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 8**	**FIG A8**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 9	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Oam Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 28 March 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 39' 40,4" S 27° 47' 24,9" E	

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		Slightly moist, light grey, very loose, intact, silty ***SAND***. Fine colluvium.	
	0,40		
		Slightly moist, light brown mottled light grey, stiff becoming very stiff, ferruginized clayey ***SILT*** and matrix supported, medium coarse, rounded, black, ferricrete concretions. Residual diabase.	● Lab no 4552
	2,00		

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
Consolidation sample / Konsolidasie monster	C
Indicator tests / Klassifikasie toets	I

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation at 2000mm due to slow progress.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 9**	**FIG A9**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	10
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 39' 43,1" S 27° 47' 36,3" E

SHEET No: / Vel Nr: 1

DATE: / DATUM: 28 March 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Sample / Monster
		Slightly moist, light grey, very loose, intact, silty ***SAND***. Fine colluvium.
	0,60	Slightly moist, light yellow mottled light grey, soft, intact, sandy ***SILT***. Residual diabase.
	1,00	Slightly moist, light brown mottled light grey speckled black, firm, ferruginized, sandy ***CLAY*** and matrix supported, fine, rounded, black, ferricrete concretions. Residual diabase.
	1,60	Slightly moist, light grey mottled pale light yellow, stiff, intact, clayey ***SILT***. Residual diabase.
	2,20	

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
Consolidation sample / Konsolidasie monster	C
Indicator tests / Klassifikasie toets	I

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 No seepage encountered.

3 No seepage encountered in standard percolation test.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 10**	**FIG A10**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 11	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Dam Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 28 March 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 39' 41,2" S 27° 47' 47,8" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Description	Sample / Monster
	0,20	Slightly moist, light grey brown, loose, intact, silty ***SAND***. Fine colluvium.	
	1,20	Slightly moist, light brown, stiff, fissured, silty ***CLAY***. Residual diabase.	● Lab no 4593
	1,40	Slightly moist, light brown mottled light grey speckled black, very stiff, ferruginized, sandy ***CLAY*** and matrix supported, fine, rounded, black, ferricrete concretions. Residual diabase.	

Symbol	Key
▽	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
⊔	Bottom of hole / Bodem van gat
---	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests / Klassifikasie toets

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	4 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation at 1400mm due to very slow penetration.

2 No seepage encountered.

SOIL KRAFT	SOIL PROFILE : TEST PIT 11	FIG A11

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	1
SITE: / TERREIN:	Proposed New Waste Site	SHEET No: / Vel Nr:	1
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOGGED BY: / BESKRYF:	FJB
		DATE: / DATUM:	27 March 2002
		LOCATION: / POSISIE:	26° 38' 38,5" S 27° 49' 03,5" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
	0,30	***FILL*** : Consisting of fine, angular, granular and cobble sized slag. Made ground.	
	1,40	Abundant, clast supported, medium coarse, subrounded, ***GRAVELS*** of ferricrete in a matrix of wet, light grey, silty sand. Overall consistency is very loose. Ferruginized fine colluvium.	
	2,20	Moist, orange stained black on discontinuities, very stiff, micaceous, sandy ***SILT***. Material characteristics approach that of soft rock. Residual shale.	

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Excavation terminated at 2200mm due to slow progress.

2 Very strong seepage encountered between 300mm and 1400mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 1**	**FIG A12**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 2	SHEET No: Vel Nr: 1
SITE: TERREIN:	Proposed New Waste Site	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 1 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 38' 30,1" S 27° 49' 02,7" E

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m		Sample Monster
	0,20	***FILL*** : Consisting of fine, angular, granular and cobble sized slag. Made ground.	
	1,00	Very moist, light yellow grey, very loose, intact, silty ***SAND***. Fine colluvium.	
	1,90	Abundant, clast supported, medium coarse, subrounded, ***GRAVELS*** of ferricrete and rounded ***COBBLES*** of quartzite in a matrix of wet, light grey, silty sand. Overall consistency is loose. Ferruginized fine colluvium.	
	2,80	Moist, orange stained black on discontinuities, very stiff, micaceous, sandy ***SILT***. Material characteristics approach that of soft rock. Residual shale.	Lab no 4597

Water encountered Water teëgekom	
Water level Waterpeildak	
Bottom of hole Bodem van gat	
Approximate material change Benaderde materiaalverandering	
Disturbed sample Versteurde monster	
Undisturbed sample Onversteurde monster	
C Consolidation sample Konsolidasie monster	
I Indicator tests	

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	5 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Excavation terminated due to continuous collapse of test pit side walls.

2 Very strong seepage encountered between 1000mm and 1900mm.

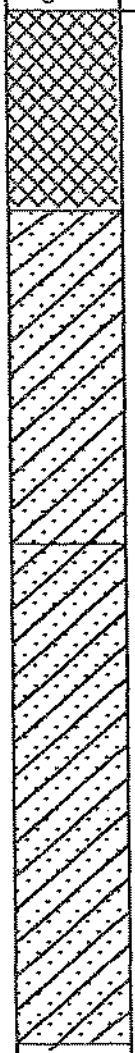
3 Refusal of excavation not encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 2**	**FIG A13**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	3
SITE: / TERREIN:	Proposed New Waste Site	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 38' 28,9" S 27° 48' 54,0" E
		SHEET No: / Vel Nr:	1
		DATE: / DATUM:	1 April 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende | Depth / Diepte m | Sample / Monster



0,60

FILL : Consisting of fine, angular, granular and cobble sized slag.
Made ground.

Moist, light grey, soft, intact, sandy ***CLAY***.
Residual diabase ?

1,60

Moist, pale light yellow mottled light grey, soft, intact, sandy ***CLAY***.
Residual diabase ?

3,10

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C — Consolidation sample / Konsolidasie monster	
I — Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered between 500mm and 600mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 3**	**FIG A14**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	4
SITE: / TERREIN:	Proposed New Waste Site	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 38' 32,8" S 27° 48' 55,5" E
		SHEET No: / Vel Nr:	1
		DATE: / DATUM:	1 April 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m		Sample / Monster
	0,40	***FILL*** : Consisting of fine, angular, granular and cobble sized slag. Made ground.	
	1,00	Very moist, light yellow grey, very loose, intact, silty ***SAND***. Fine colluvium.	
	1,90	Abundant, clast supported, medium coarse, subrounded, ***GRAVELS*** of ferricrete and rounded ***COBBLES*** of quartzite in a matrix of wet, light grey, silty sand. Overall consistency is dense. Ferruginized fine colluvium.	
	2,70	Moist, orange stained black on discontinuities, stiff, micaceous, sandy ***SILT***. Material characteristics approach that of soft rock. Residual shale.	Lab no 4598

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Oorsteurde monster	
Consolidation sample / Konsolidasie monster	C
Indicator tests	I

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Very strong seepage encountered between 1100mm and 1900mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 4**	**FIG A15**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 5	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Waste Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 1 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 38' 41,7" S 27° 48' 55,2" E

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m		Sample / Monster
	0,30	***FILL*** : Consisting of fine, angular, granular and cobble sized slag. Made ground.	
	0,60	Very moist, light yellow grey, very loose, intact, silty ***SAND***. Fine colluvium.	
	1,60	Abundant, clast supported, medium coarse, subrounded, ***GRAVELS*** of ferricrete and rounded ***COBBLES*** of quartzite in a matrix of wet, light grey, silty sand. Overall consistency is loose. Ferruginized fine colluvium.	▽
	2,40	Abundant, clast supported, rounded, ***COBBLES*** of chert, quartz and quartzite in a matrix of dark yellow mottled dark red blotched black, hardpan pedocretes. Overall consistency is dense. Ferruginized quaternary gravels.	

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation encountered at 2400mm on very dense pedocretes.

2 Very strong seepage encountered between 600mm and 1600mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 5**	**FIG A16**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 6	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Waste Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 1 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 38' 28,9" S 27° 48' 44,4" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		FILL : Consisting of fine, angular, granular and cobble sized slag. Made ground.	
	0,60	Wet, light yellow grey, very loose, intact, silty ***SAND***. Fine colluvium.	
	1,20	Abundant, clast supported, medium coarse, subrounded, ***GRAVELS*** of ferricrete and rounded ***COBBLES*** of quartzite in a matrix of wet, light grey, silty sand. Overall consistency is loose. Ferruginized fine colluvium.	
	1,80		

	Water encountered / Water teëgekom
	Water level / Waterrusvlak
	Bottom of hole / Bodem van gat
	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Test pit abandoned due to very strong seepage.

2 Very strong seepage encountered between 600mm and surface.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 6**	**FIG A17**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 7	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Proposed New Waste Site	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 1 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 38' 28,8" S 27° 49' 05,7" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m		Sample / Monster
	0,60	Very moist, light yellow grey, very loose, intact, silty ***SAND***. Fine colluvium.	
	1,70	Wet, light yellow grey, very loose, intact, silty ***SAND*** and matrix supported, medium coarse, subrounded and rounded, ferricrete concretions. Ferruginized fine colluvium.	▽
	2,80	Moist, light red mottled light yellow, stiff, fissured, sandy ***SILT***. Residual shale. Material characteristics approach that of soft rock.	● Lab no 4599

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Very strong seepage encountered between 1100mm and 1900mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 7**	**FIG A18**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 1	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Existing Dams	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 1 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 38' 38,5" S 27° 49' 03,5" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Sample / Monster
	Moist, light red, very loose, intact, silty ***SAND***. Fine colluvium.	
	1,10	
	Abundant clast supported, coarse, angular, black ***GRAVELS*** of ferricrete in a matrix of wet, dark yellow, silty sand. Overall consistency is very loose. Ferruginized fine colluvium.	
	2,20	
	Abundant, clast supported, rounded, ***COBBLES*** of chert, quartz and quartzite in a matrix of dark yellow mottled dark red blotched black, hardpan pedocretes. Overall consistency is dense. Ferruginized quaternary gravels.	
	2,60	

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Very strong seepage encountered between 1400mm and 2100mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 1**	**FIG A19**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 2	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Existing Dams	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 1 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 38' 38,5" S 27° 49' 03,5" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Sample / Monster
	Dry, light brown, medium dense, intact, silty ***SAND***. Fine colluvium.	
	0,50	
	Dry, light brown, medium dense, intact, silty ***SAND*** and matrix supported, coarse, subrounded and rounded, gravels and cobbles of quartzitic sandstone. Pebblestone marker.	
	0,70	
	Slightly moist, light brown, loose, intact, silty ***SAND*** and matrix supported, fine, rounded, ferricrete nodules. Residual quartzitic sandstone.	
	1,40	
	Slightly moist, dark red brown mottled dark yellow, very dense, cemented, silty ***SAND*** and matrix supported, subrounded and subangular, coarse gravels and cobbles of quartzitic sandstone. Ferruginized residual quartzitic sandstone.	
	2,30	

Water encountered / Water teengekom	
Water level / Waterspeil	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

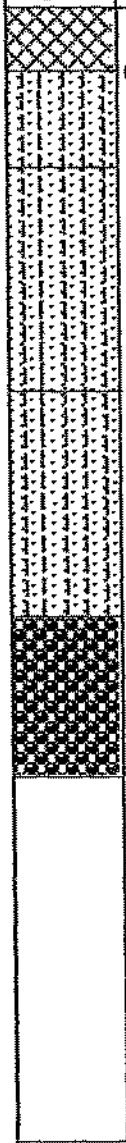
NOTES / NOTAS

1 Refusal of excavation at 2300mm on hard rock, quartzitic sandstone.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 2**	**FIG A20**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 3	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Existing Dams	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 1 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 38' 59,7" S 27° 49' 37,7" E	



Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
0,20	***FILL*** : Consisting of slightly moist, light red, loose, silty sand. Made ground.	
0,50	Moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.	
	Very moist, dark yellow, very loose, intact, silty ***SAND***. Fine colluvium.	
1,20	Wet, light yellow grey discoloured dark brown black, very loose, polluted, silty ***SAND*** and matrix supported, rounded, medium coarse, gravels of ferricrete. Ferruginized fine colluvium. **Pollutants, presumably tar residu, are contained in the soil matrix as dark brown black deposits.**	⩛
1,90		
	Abundant, clast supported, rounded, ***COBBLES*** of chert, quartz and quartzite in a matrix of dark yellow mottled dark red blotched black, hardpan pedocretes. Overall consistency is very dense. Ferruginized quaternary gravels. **Pollutants, presumably tar residu, are contained in the soil matrix as dark brown black deposits.**	
2,40		

⩛	Water encountered / Water teëgekom
▼	Water level / Waterspeil
	Bottom of hole / Bodem van gat
- - -	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Waterviak:	

NOTES / NOTAS

1 Refusal of excavation at 2400mm on very dense, ferruginized, quaternary gravels.

2 Very strong seepage encountered between 1200mm and 1900mm.

3 In-situ materials smell very strongly of tar.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 3**	**FIG A21**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 4	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Existing Dams	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: 26° 38' 59,0" S POSISIE: 27° 49' 51,7" E	

SOIL PROFILE - GRONDPROFIEL

Depth / Diepte m	Description	Sample / Monster
	Very moist, light yellow, very loose, intact, silty ***SAND***. Fine colluvium.	
0,80		
1,00	Very moist, light yellow grey, very loose, intact, silty ***SAND***. Fine colluvium.	▽
1,20	Wet, light yellow grey discoloured dark brown black, very loose, polluted, silty ***SAND*** and matrix supported, rounded, medium coarse, gravels of ferricrete. Ferruginized fine colluvium.	
1,30	Abundant, clast supported, rounded, ***COBBLES*** of chert, quartz and quartzite in a matrix of dark yellow mottled dark red blotched black, hardpan pedocretes. Overall consistency is very dense. Ferruginized quaternary gravels.	

▽	Water encountered / Water teëgekom
▼	Water level / Watervlak
⌊⌋	Bottom of hole / Bodem van gat
----	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation at 1300mm on very dense, ferruginized, quaternary gravels.

2 Very strong seepage encountered between 1000mm and 1200mm.

3 In-situ materials smell very strongly of tar.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 4**	**FIG A22**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 5	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Existing Dams	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 38' 59,4" S 27° 49' 42,8" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m		Sample / Monster
		Slightly moist, light brown, loose, intact, silty ***SAND***. Fine colluvium.	
	0,50	Very moist, light red mottled light grey, loose, intact, silty ***SAND*** and matrix supported, rounded, medium coarse, gravels of ferricrete. Ferruginized fine colluvium.	⌡ ⩛
	1,40	Moist, light red mottled light grey green, medium dense, polluted, silty ***SAND***. Residual diabase ? **Horizon is visibly polluted by grey green deposits in the soil matrix.**	
	2,50		

⩛	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
⌊⌋	Bottom of hole / Bodem van gat
- - -	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
T	Indicator tests

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	5 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Very strong seepage encountered between 1200mm and 1400mm.

3 In-situ materials smell very strongly of tar.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 5**	**FIG A23**

PROJECT: PROJEK:	Master Plan for Pollution Control – Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 6	SHEET No: Vel Nr: 1
SITE: TERREIN:	Existing Dams	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 58,0" S 27° 50' 04,3" E

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		Very moist, light yellow brown, loose, intact (polluted ?), silty ***SAND.*** Fine colluvium.	
	0,70		
	0,80 0,90	Abundant clast supported, medium coarse, rounded, ***GRAVELS*** of ferricrete in a matrix of light yellow brown, silty sand. Overall consistency is dense. Ferruginized fine colluvium.	Lab no 4600
		Abundant, clast supported, rounded, ***COBBLES*** of chert, quartz and quartzite in a matrix of dark yellow mottled dark red blotched black, hardpan pedocretes. Overall consistency is dense. Ferruginized quaternary gravels.	

	Water encountered Water teëgekom
	Water level Waterrusvlak
	Bottom of hole Bodem van gat
	Approximate material change Benaderde materiaalverandering
	Disturbed sample Verskeurde monster
	Undisturbed sample Onverskeurde monster
C	Consolidation sample Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	6 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation encountered at 900mm on very dense, ferruginized, quaternary deposits.

2 Seepage encountered between 800mm and 900mm.

3 In-situ materials smell very strongly of tar.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 6**	**FIG A24**

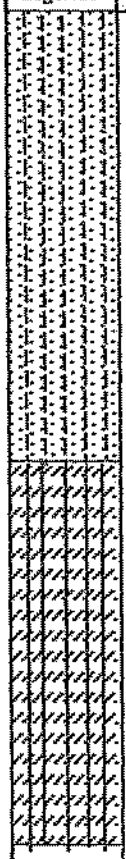
PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT:	7
SITE: / TERREIN:	Existing Dams	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 37' 16,4" S 27° 49' 49,7" E

SHEET No: / Vel Nr: 1

DATE: / DATUM: 2 April 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende | Depth / Diepte m | Sample / Monster



0,00

Moist to very moist, pale light yellow grey mottled light brown, loose, silty ***SAND*** and matrix supported, rounded, fine, black ferricrete concretions and coarse, subrounded, gravels of quartzite.
Fine colluvium ?
Soil profile disturbed due to embankment construction.

1,40

Very moist, pale light yellow mottled light red, soft, intact, clayey ***SILT***.
Residual diabase.

2,60

	Water encountered / Water teëgekom
	Water level / Waterrusvlak
	Bottom of hole / Bodem van gat
	Approximate material change / Benaderde materiaalverandering
	Disturbed sample / Versteurde monster
	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	6 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered between 1100mm and 1500mm.

SOIL KRAFT	SOIL PROFILE : TEST PIT 7	FIG A25

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	8
SITE: TERREIN:	Existing Dams	LOGGED BY: BESKRYF:	FJB
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 39,6" S 27° 49' 38,7" E

SHEET No: Vel Nr: 1

DATE: DATUM: 2 April 2002

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m	
		Moist, light grey, loose intact (polluted ?), clayey ***SAND***. Fine colluvium.
	0,50	
	0,80	Abundant clast supported, fine, rounded, ferricrete ***GRAVELS*** and subangular, coarse, ***GRAVELS*** of quartzite in a matrix of moist, light grey, (polluted ?), clayey ***SAND***. Overall consistency is loose. Ferruginized pebblestone marker.
		Slightly moist, light red mottled light yellow speckled black, firm, sandy ***SILT*** and matrix supported, fine, rounded, black, ferricrete nodules. Residual diabase.
	2,10	

Sample Monster

	Water encountered Water teëgekom
	Water level Waterrusvlak
	Bottom of hole Bodem van gat
	Approximate material change Benaderde materiaalverandering
	Disturbed sample Versteurde monster
	Undisturbed sample Onversteurde monster
C	Consolidation sample Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	6 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Waterviak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

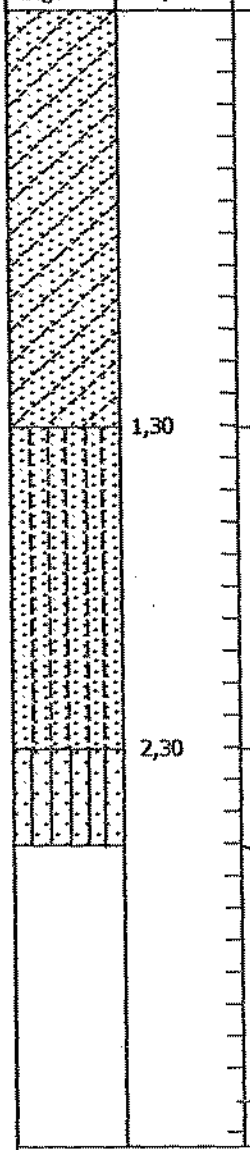
2 Seepage encountered at 1600mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 8**	**FIG A26**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 9	SHEET No: Vel Nr: 1
SITE: TERREIN:	Existing Dams	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE: 26° 37' 29,1" S 27° 49' 38,7" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende | Depth / Diepte m | Sample / Monster



1,30

Moist, light grey, loose intact (polluted ?), clayey ***SAND***.
Fine colluvium.

Wet, light yellow grey, very loose, polluted, silty ***SAND*** and matrix supported, rounded, medium coarse, gravels of ferricrete.
Pebblestone marker (?).

2,30

Very moist, dark yellow mottled dull dark red, soft, intact, sandy ***SILT***.
Residual diabase.

▽	Water encountered / Water teëgekom
▼	Water level / Waterrusvlak
	Bottom of hole / Bodem van gat
- - -	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	6 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Very strong seepage between 1300mm and 2300mm.

3 Sidewalls collapse between 1300mm and 2300mm. Test pit abandoned.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 9**	**FIG A27**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 10	SHEET No: Vel Nr: 1
SITE: TERREIN:	Existing Dams	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 57,0" S 27° 49' 42,9" E

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		Abundant clast supported, large blocks (>500mm Ø) of dark brown mottled dark red and black, very dense, ferruginized cemented ***GRAVELS*** in a matrix of wet, light yellow, silty sand. Quaternary gravels.	
	1,00	Moist, light red mottled light yellow, firm, intact, clayey ***SILT***. Residual diabase.	Lab no 4601
	2,50		

	Water encountered Water toegekom
	Water level Waterpeil
	Bottom of hole Bodem van gat
	Approximate material change Benaderde materiaalverandering
	Disturbed sample Versteurde monster
	Undisturbed sample Onversteurde monster
C	Consolidation sample Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	6 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Waterviak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered between surface and 1100mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 10**	**FIG A28**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 1	SHEET No: Vel Nr: 1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 39' 17,5" S 27° 48' 10,3" E

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		Moist, light grey mottled pale light grey, soft, slickensided, silty ***CLAY*** and matrix supported, medium coarse, subrounded, calcereous concretions. Reworked residual diabase ?	
	2,40		
	2,80	Moist, pale light grey mottled dark yellow, firm, slickensided, silty ***CLAY*** and matrix supported, medium coarse, subrounded, calcereous concretions. Residual diabase ?	

Water encountered Water teëgekom	
Water level Watemusvlak	
Bottom of hole Bodem van gat	
Approximate material change Benaderde materiaalverandering	
Disturbed sample Versteurde monster	
Undisturbed sample Onversteurde monster	
Consolidation sample Konsolidasiemonster	C
Indicator tests	I

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Waterviak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered at 1700mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 1**	**FIG A29**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 2	SHEET No: Vel Nr: 1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 39' 33,8" S 27° 48' 02,2" E

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m	Sample Monster
		FILL : Consisting of slightly moist, pale light grey, soft, sandy clay.
	0,60	Slightly moist, light grey becoming light brown, loose, pinhole voided, silty ***SAND***. Fine colluvium.
	1,00	
	1,30	Slightly moist, light brown becoming dark yellow, loose, intact, silty ***SAND***. Fine colluvium.
	1,90	Slightly moist, dark yellow speckled black, medium dense, ferruginized, silty ***SAND*** and matrix supported, medium coarse, black, ferricrete concretions. Reworked residual diabase ?
	2,60	Slightly moist, dark yellow mottled light grey speckled black, stiff, slickensided and ferruginized, silty ***CLAY***. Residual diabase.

▽Z	Water encountered Water teengekom
▼	Water level Watervlak
L	Bottom of hole Bodem van gat
----	Approximate material change Benaderde materiaalverandering
●	Disturbed sample Versteurde monster
■	Undisturbed sample Onversteurde monster
C	Consolidation sample Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation at 2600mm due to slow progress.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 2**	**FIG A30**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 3	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Perimeter Test Pits	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 39' 07,7" S 27° 48' 12,6" E	

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		FILL : Consisting of slightly moist, pale light grey, soft, sandy clay.	
	0,90	Very moist, dark yellow, very loose, pinhole voided, silty ***SAND***. Fine colluvium.	
	1,60	Wet, dark yellow mottled black, loose, polluted, silty ***SAND*** and matrix supported, medium coarse, rounded, gravels of ferricrete. Reworked residual diabase ?	▼
	2,10	Abundant clast supported, medium coarse, rounded, black, ***GRAVELS*** of ferricrete in a matrix of very moist, dark yellow, silty sand. Overall consistency is medium dense. Reworked residual diabase ?	
	2,50		

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	11 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Test pit abandoned at 2500mm due to very strong influx of water from 1600mm to 2100mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 3**	**FIG A31**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 4	SHEET No: Vel Nr: 1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: 26° 38' 56,2" S POSISIE: 27° 48' 14,9" E	

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m		Sample Monster
		Moist, black, soft, slickensided, silty ***CLAY.*** Fine colluvium.	
	1,00	Moist, light grey, soft, slickensided, silty ***CLAY.*** Residual diabase.	
	1,50	Moist, light grey, soft, intact, clayey ***SILT*** and matrix supported fine, subangular, medium coarse, dirty white, calcereous concretions. Residual diabase.	
	1,80	Slightly moist, light brown mottled black blotched light grey, stiff, ferruginize cemented, sandy ***SILT***. Residual diabase.	
	2,70		

Water encountered Water teëgekom	
Water level Watervlak	
Bottom of hole Bodem van gat	
Approximate material change Benaderde materiaalverandering	
Disturbed sample Versteurde monster	
Undisturbed sample Onversteurde monster	
C Consolidation sample Konsolidasie monster	
I Indicator tests	

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation at 2700mm due to very slow penetration.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 4**	**FIG A32**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 5	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Perimeter Test Pits	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 38' 44,3" S 27° 48' 17,1" E	

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Description	Sample / Monster
	0,70	Moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.	
	1,30	Slightly moist, dark yellow mottled light brown and black, dense, ferruginized cemented, silty ***SAND*** and matrix supported, subrounded, medium coarse, ferricrete gravels. Ferruginized fine colluvium ?	
	1,50	Dark brown mottled black and dark yellow, very dense, hardpan ***FERRICRETE***. Pedocretic deposits.	

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C — Consolidation sample / Konsolidasie monster	
I — Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	11 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation at 1500mm on very dense, hardpan ferricrete.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 5**	**FIG A33**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 6	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Perimeter Test Pits	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 38' 31,9" S 27° 48' 21,1" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		FILL : Consisting of moist, light yellow grey, soft, silty clay.	
	1,00	Moist, black, soft, slickensided, silty ***CLAY***. Fine colluvium.	
	1,60	Very moist, pale light grey, very soft, slickensided, silty ***CLAY***. Residual diabase.	
	3,20		

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	11 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Test pit excavated to limit of TLB.

2 Seepage encountered at 2000mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 6**	**FIG A34**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 7	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Perimeter Test Pits	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 38' 19,9" S 27° 48' 24,9" E	

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		Dark brown mottled black, very dense, honeycombe ***FERRICRETE.*** Pedocretic deposits. Voids are open and filled with light grey clay.	
	1,10		

Water encountered / Water teëgekom	Contractor: / Kontrakteur: Vuma Construction	NOTES / NOTAS	
Water level / Waterspeil	Date Drilled: / Datum Geboor: 11 March 2002	1 Refusal of excavation encountered at 1100mm on very dense pedocretes.	
Bottom of hole / Bodem van gat	Machine: / Masjien: Caterpillar 416C		
Approximate material change / Benaderde materiaalverandering	Hole diameter: / Gat deursnee: 600mm	2 No seepage encountered.	
Disturbed sample / Versteurde monster	Water depth: / Watervlak:		
Undisturbed sample / Onversteurde monster			
Consolidation sample / Konsolidasie monster			
Indicator tests			

SOIL KRAFT	**SOIL PROFILE : TEST PIT 7**	**FIG A35**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	8	SHEET No. Vel Nr:	1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 57,8" S 27° 48' 31,5" E		

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		Moist, black, soft, intact, sandy **CLAY**. Fine colluvium.	
	0,60	Moist, light yellow grey, soft, intact, sandy **CLAY**. Residual diabase.	
	2,00	Slightly moist, pale light grey mottled dark yellow, stiff, slickensided, silty **CLAY** and matrix supported, fine rounded, ferricrete nodules. Residual diabase.	
	2,70		

Water encountered / Water teëgekom	
Water level / Waterspeil	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage not encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 8**	**FIG A36**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	9	SHEET No: Vel Nr:	1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 47,2" S 27° 48' 12,1" E		

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		FILL : Consisting of coarse, granulated slag. Road construction layerworks.	
	0,60	Very moist, black, soft, intact, sandy ***CLAY***. Fine colluvium.	
	1,20	Very moist, pale light grey, soft, intact, sandy ***CLAY***. Residual diabase.	
	1,70	Moist, pale light grey, very soft, slickensided, silty ***CLAY***. Residual diabase.	
	2,60		

	Water encountered Water teëgekom
	Water level Watervlak
	Bottom of hole Bodem van gat
	Approximate material change Benaderde materiaalverandering
	Disturbed sample Versteurde monster
	Undisturbed sample Onversteurde monster
C	Consolidation sample Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage not encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 9**	**FIG A37**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	10	SHEET No: Vel Nr:	1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 54,5" S 27° 48' 58,7" E		

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m		Sample Monster
		FILL : Consisting of coarse, granulated slag, pig iron etc. Road construction layerworks.	
	0,50	Very moist, dark grey, very loose, intact, silty ***SAND***. Fine colluvium.	⩛
	1,00	Very moist, light grey, soft, intact, sandy ***CLAY***. Residual diabase.	
	1,30	Slightly moist, light yellow mottled light grey, soft, slickensided, clayey ***SILT***. Residual diabase.	⩛
	2,90		

⩛	Water encountered / Water teëgekom
▼	Water level / Watervlak
	Bottom of hole / Bodem van gat
----	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered at 800mm and 2700mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 10**	**FIG A38**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	11	SHEET No: Vel Nr:	1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 56,0" S 27° 48' 48,3" E		

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m	
	0,30	***FILL*** : Consisting of coarse, granulated slag. Road construction layerworks.
	0,40	Light brown mottled dark red, very dense, hardpan ***FERRICRETE.*** Pedocretic deposit.
	1,10	Moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.
		Slightly moist, light olive mottled light grey speckled black, soft, slickensided, silty ***CLAY***. Residual diabase.
	2,70	

Sample Monster

Water encountered / Water teëgekom	
Water level / Waterspeil	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
Indicator tests	

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage not encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 11**	**FIG A39**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 12	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Perimeter Test Pits	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 39' 28,8" S 27° 50' 25,6" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		Slightly moist, light brown, loose, intact, silty ***SAND***. Fine colluvium.	
	0,60	Slightly moist, light yellow, loose, intact, silty ***SAND*** and matrix supported, subangular, medium coarse, gravels of ferricrete and subrounded coarse gravels of quartzite. Pebblestone marker ?	
	1,50	Moist, dark red mottled dark yellow speckled black, very dense, ferruginized, silty ***SAND*** and matrix supported, coarse angular gravels of quartzite and rounded cobbles of quartz, quartzite and chert. Ferruginized quaternary gravels.	⊻
	2,20		

▽	Water encountered / Water teëgekom
▼	Water level / Watervlak
	Bottom of hole / Bodem van gat
- - -	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	11 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation encountered at 2200mm on very dense quaternary gravels.

2 Seepage encountered at 1500mm to 1700mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 12**	**FIG A40**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 13	SHEET No: Vel Nr: 1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE: 26° 39' 29,2" S 27° 50' 16,9" E	

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		Moist, light grey mottled light brown, loose, intact, silty ***SAND***. Fine colluvium.	
	1,10	Moist, light grey mottled light yellow, loose, intact, clayey ***SAND***. Residual shale ?	
	1,50	Very moist, light grey mottled light yellow, dense, ferruginize, cemented, clayey ***SAND***. Residual shale ?	⩛
	2,10	Slightly moist, light brown mottled light grey blotched black, ferruginize cemented, very dense, clayey ***SAND***. Residual shale ?	
	2,60		

⩛	Water encountered / Water teëgekom
▼	Water level / Watervlak
⌊⌋	Bottom of hole / Bodem van gat
- - -	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	11 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered at 1700mm to 2100mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 13**	**FIG A41**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	14	SHEET No: Vel Nr:	1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 40' 14,7" S 27° 48' 52,2" E		

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		FILL : Consisting of ash, granulated slag etc.	
	0,80	Moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.	
	1,40	Moist, pale light yellow grey, very loose, intact, silty ***SAND***. Fine colluvium.	
	1,90	Wet, light grey mottled dark yellow, very loose, intact, clayey ***SAND***. Residual diabase.	▼
	2,20	Moist, light grey mottled dark yellow, stiff, ferruginized cemented, sandy ***CLAY***. Residual diabase.	
	2,80		

▽	Water encountered Water teëgekom
▼	Water level Watervlak
	Bottom of hole Bodem van gat
- - -	Approximate material change Benaderde materiaalverandering
●	Disturbed sample Versteurde monster
■	Undisturbed sample Ongesteurde monster
C	Consolidation sample Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	12 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered at 1900mm to 2200mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 14**	**FIG A42**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT: 15	SHEET No: Vel Nr: 1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 40' 23,6" S 27° 49' 33,0" E

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m	Sample Monster
	2,00	
	2,50	
	2,90	

Moist, light red, very loose, intact, silty ***SAND***.
Fine colluvium.

Moist, light red mottled dark yellow, soft, intact, sandy ***SILT***.
Reworked residual diabase.

Slightly moist, light yellow mottled light red stained black, stiff, ferruginize cemented, sandy ***SILT*** and matrix supported, rounded, cobbles of diabase.
Reworked residual diabase.

▽	Water encountered Water teëgekom
▼	Water level Watervlak
	Bottom of hole Bodem van gat
----	Approximate material change Benaderde materiaalverandering
●	Disturbed sample Versteurde monster
■	Undisturbed sample Onversteurde monster
C	Consolidation sample Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	12 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered at 2700mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 15**	**FIG A43**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	16	SHEET No: Vel Nr.	1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 40' 23,6" S 27° 49' 46,0" E		

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		Very moist becoming wet, light brown, very loose, intact, silty ***SAND***. Fine colluvium.	▽
	1,90	Very moist becoming wet, light brown, very loose, intact, silty ***SAND*** and matrix supported, rounded, medium coarse ferricrete gravels. Fine colluvium.	
	2,60		

▽	Water encountered ~~Water teëgekom~~
▼	Water level ~~Watermylak~~
	Bottom of hole ~~Bodem van gat~~
- - -	Approximate material change ~~Benaderde materiaalverandering~~
●	Disturbed sample ~~Versteurde monster~~
■	Undisturbed sample ~~Onversteurde monster~~
C	Consolidation sample ~~Konsolidasie monster~~
I	Indicator tests

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	12 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered at 1700mm.

3 Test pit side wall collapse from 1600mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 16**	**FIG A44**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: TOETSGAT:	18	SHEET No: Vel Nr:	1
SITE: TERREIN:	Perimeter Test Pits	LOGGED BY: BESKRYF:	FJB	DATE: DATUM:	2 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 40' 03,3" S 27° 50' 14,6" E		

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
		Moist, black, loose, intact, silty ***SAND***. Fine colluvium.	
	0,60		
		Very moist becoming wet, dark yellow mottled light brown, very soft, intact, sandy ***SILT***. Residual diabase ?	
	1,50		
	1.80	Abundant clast supported, black, angular, medium coarse, ***GRAVELS*** of ferricrete in a matrix of pale light grey, silty sand. Overall consistency is dense.	

Water encountered Water teëgekom	
Water level Watervlak	
Bottom of hole Bodem van gat	
Approximate material change Benaderde materiaalverandering	
Disturbed sample Versteurde monster	
Undisturbed sample Onversteurde monster	
Consolidation sample Konsolidasie monster	C
Indicator tests	I

Contractor: Kontrakteur:	Vuma Construction
Date Drilled: Datum Geboor:	12 March 2002
Machine: Masjien:	Caterpillar 416C
Hole diameter: Gat deursnee:	600mm
Water depth: Waterviak:	

NOTES / NOTAS

1 Refusal of excavation not encountered.

2 Seepage encountered at 1100mm to 1500mm.

3 Test pit side wall collapse from 1200mm.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 18**	**FIG A46**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	TRAIL HOLE: / TOETSGAT: 19	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	Perimeter Test Pits	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 2 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 39' 05,7" S 27° 50' 52,3" E	

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		Very moist, light yellow, very loose, intact, silty ***SAND*** and matrix supported, rounded, black, medium coarse, gravels of ferricrete.	
	1,40		
	1,60	Moist, dark red mottled dark yellow speckled black, very dense, ferruginized, silty ***SAND*** and matrix supported, coarse angular gravels of quartzite and rounded cobbles of quartz, quartzite and chert. Ferruginized quaternary gravels.	

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
Consolidation sample / Konsolidasie monster	C
Indicator tests	I

Contractor: / Kontrakteur:	Vuma Construction
Date Drilled: / Datum Geboor:	11 March 2002
Machine: / Masjien:	Caterpillar 416C
Hole diameter: / Gat deursnee:	600mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of excavation encountered at 1600mm on very dense quaternary gravels.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : TEST PIT 19**	**FIG A47**

Cyferpan and Farmlands Test Pits

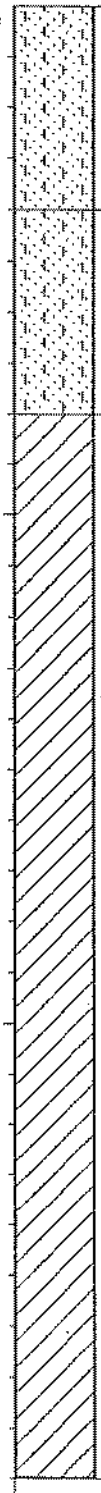
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP1
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Moist, dark brown, intact, transported.

0.40 Medium dense silty SAND.
Moist, light yellowish orange, intact, transported.

0.80 Firm CLAY.
Moist, light olive, intact, transported.

S127

2.90

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NOTES

1) Disturbed sample S127 at 2.9m.

2) Water in bottom of hole.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP1

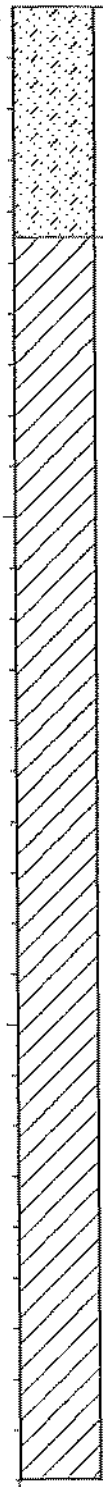
SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP2
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense clayey SAND.
Slightly moist, dark grey, intact, transported.

0.45 Firm CLAY.
Moist, dark olive, intact, transported.

2.90

NOTES

2) Water in bottom of hole.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP2

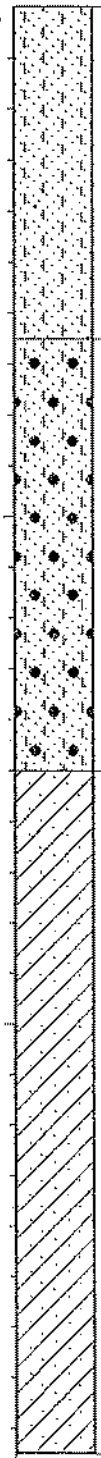
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP3
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Slightly moist, dark grey, intact, transported.

0.65 Medium dense silty SAND with FERRICRETE.
Slightly moist, light yellowish orange, intact, transported.

1.50 Firm sandy CLAY.
Slightly moist, light yellowish orange dark olive mottled, intact, transported.

OX100 ● 2.85

NOTES

1) Disturbed sample OX100 at 2.85m.

2) Water in bottom of hole.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP3

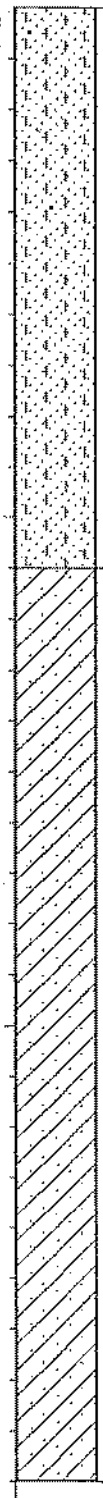
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP4
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Slightly moist, dark grey, intact, transported.

1.10 Firm sandy CLAY.
Moist, dark yellowish orange with dark olive mottled, intact, transported.

2.90

NOTES

2) Water in bottom of hole.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP4

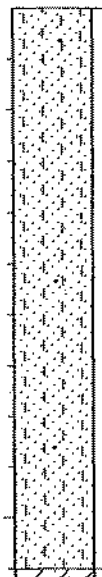
SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP5
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Slightly moist, dark grey, intact, transported.

1.10 Firm sandy CLAY.
Moist, light yellowish orange dark olive mottled.

2.85

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP5

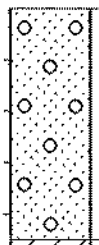
SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP6
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Firm gravelly SAND.
Moist, dark grey, intact, transported.

0.45 Firm CLAY.
Moist, dark olive, intact, transported.

2.85

NOTES

2) Water in bottom of hole.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP6

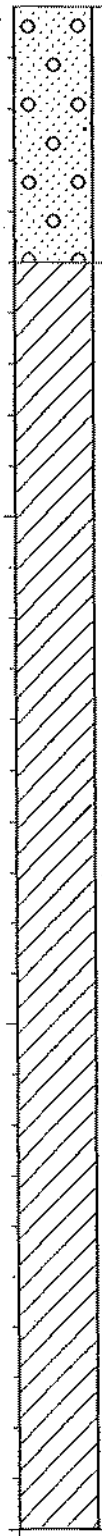
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP7
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense gravelly SAND.
Slightly moist, dark grey, intact, transported.

0.50 Firm CLAY.
Moist, dark grey, intact, transported.

3.00

NOTES

2) Water in bottom of hole.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

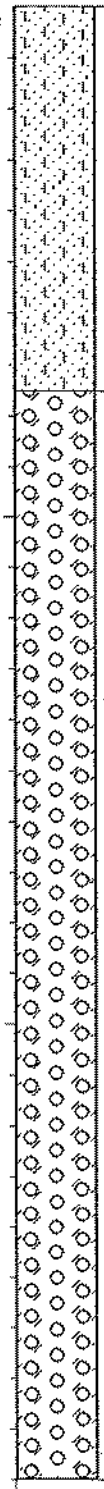
HOLE No: TP7

SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP8
Sheet 1 of 1

JOB NUMBER: S02-193



0.00 Medium dense silty SAND. Slightly moist, dark grey, intact, transported.

0.75 Medium dense clayey GRAVEL with FERRICRETE. Slightly moist, light yellowish orange, intact, transported.

2.90

NOTES

1) Disturbed sample XXX2 at 2.9m.

2) Water in bottom of hole.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP8

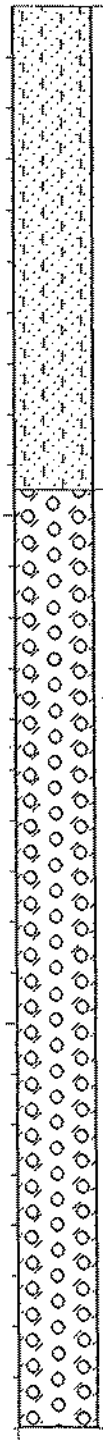
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP9
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND. Slightly moist, dark grey, intact, transported.

0.95 Firm clayey GRAVEL with FERRICRETE. Moist, light yellowish orange, intact, transported.

2.80

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CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP9

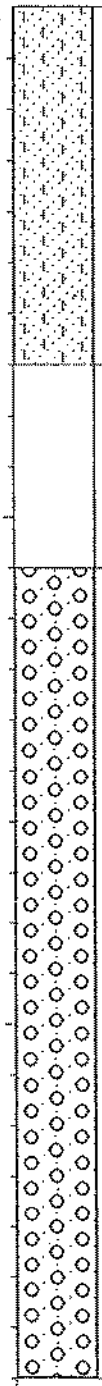
SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP10
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Slightly moist , light yellowish orange, intact transported.

0.70 Medium dense Pebble stone marker.
slightly moist, light yellowish orange, intact, transported.

1.10 Medium dense sandy GRAVEL.
Slightly moist, reddish orange, intact, transported.

NW19 ●

2.70

NOTES

1) Disturbed sample NW19 at 2.7m

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP10

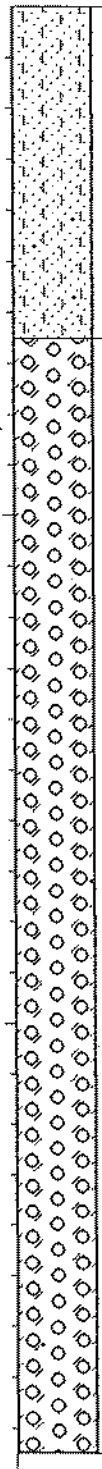
SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP11
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND. Slightly moist, dark grey, intact, transported.

0.65 Medium dense clayey GRAVEL with FERRICRETE. Slightly moist, light yellowish orange, intact, transported.

2.85

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CONFIDENTIAL
Research for IVS

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP11

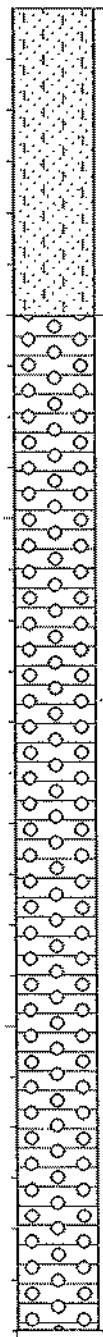
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP12
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Slightly moist, light brown, intact, transported.

0.60 Dense SHALE GRAVEL.
Slightly moist, light yellowish orange, intact, transported.

2.60

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP12

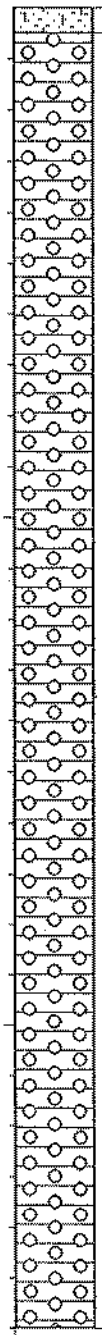
SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP13
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Slightly moist, light brown, intact, transported.

0.05 Dense SHALE GRAVEL.
Slightly moist, light yellowish orange, intact, transported.

2.60

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP13

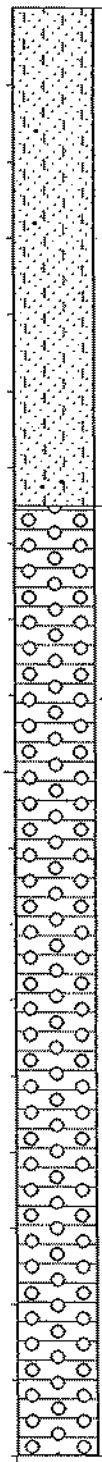
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP14
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:10



0.00 Medium dense silty SAND.
slightly moist, light brown, intact, transported.

0.65 Dense SHALE GRAVEL.
Slightly moist, light yellow orange.

1.90

NOTES

1) TLB refuse at 1.9m.

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Research for IVS

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP14

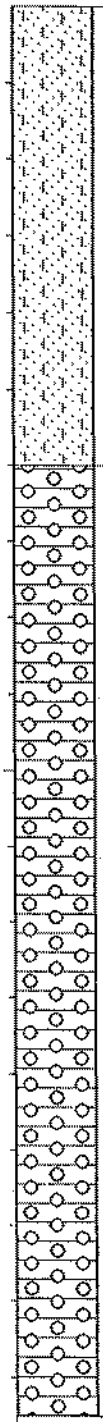
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP15
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:10



0.00 Medium dense silty SAND.
Moist, light brown, intact, transported.

0.60 Dense SHALE GRAVEL with FERRICRETE.
Moist Light yellowish orange, intact, transported.

AB203 1.85

NOTES

1) Disturbed sample AB203 at 1.85m

2) TLB refuse at 1.85m

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP15

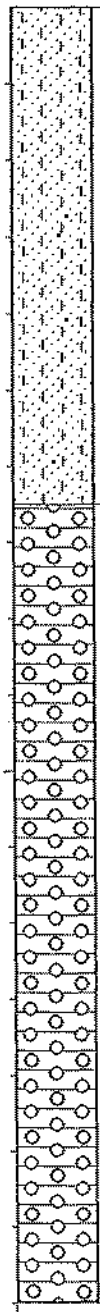
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP16
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:10



0.00

Dense silty SAND.
Slightly moist, light brown, intact, transported.

0.65

Dense SHALE GRAVEL.
Slightly moist, light yellowish orange, intact, transported.

1.70

NOTES

1) TLB refuse at 1.7m

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CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

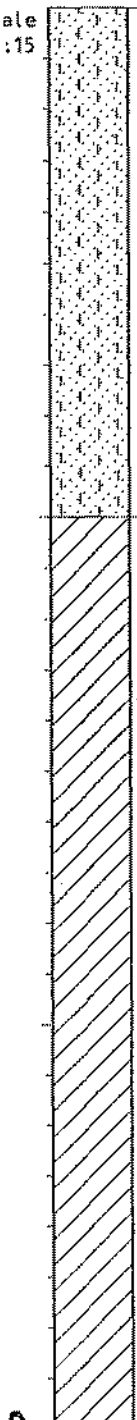
HOLE No: TP16

SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP17
Sheet 1 of 1

JOB NUMBER: S02-193



0.00 Medium dense silty SAND.
Slightly moist , light brown, intact, transport.

1.00 Firm CLAY.
Slightly moist, light olive, intact, transported.

2.80

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Research for IVS

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP17

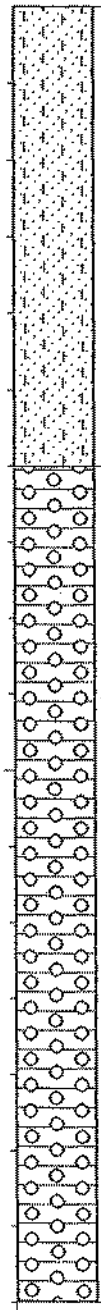
SOILLAB (PTY) LTD Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP18
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:10



0.00 Dense silty SAND.
Slightly moist, light brown, intact, transported.

0.60 Dense SHALE GRAVEL.
Slighrly moist, light yellowish orange, intact, transported.

1.70

NOTES

1) TLB refuse at 1.7m.

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CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP18

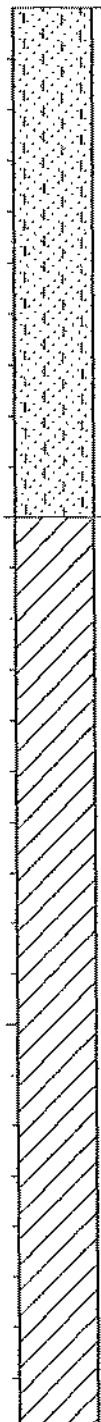
SOILLAB (PTY) LTD
Reg. No. 71/00112/07

SOILKRAFT
ISCOR

HOLE No: TP19
Sheet 1 of 1

JOB NUMBER: S02-193

Scale 1:15



0.00 Medium dense silty SAND.
Slightly moist, light brown, intact, transported.

1.00 Firm CLAY.
Slightly moist, light olive, intact, transported.

2.80

Draft for discussion
CONFIDENTIAL
Research for IVS

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : fvz
TYPE SET BY : zs
SETUP FILE : SOILAB_E.SET

INCLINATION :
DIAM :
DATE : 01-03-02
DATE : 19-03-02
DATE : 22/03/02 08:53
TEXT : C:\DOTPLOT\PROFILE\S02-193.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TP19

ISCOR FLAT STEEL PRODUCTS VANDERBIJL PARK : PROPOSED MASTER PLAN FOR WASTE MANAGEMENT - FINAL GEOTECHNICAL REPORT

8 ADDENDUM B

AUGER HOLE PROFILES

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR :	1
SITE: / TERREIN:	Southern Perimeter	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 40' 14,8" S 27° 48' 44,8" E

SHEET No: / Vel Nr: 1

DATE: / DATUM: 3 April 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Description	Sample / Monster
	0,40	***FILL*** : Consisting of slag, ash etc.	
	0,50	Very moist, dark red, loose, intact, silty ***SAND***. Fine colluvium.	▽
	1,20	Moist, dark grey, soft, intact, sandy ***CLAY***. Residual diabase.	
	1,90	Moist, pale light grey, soft, intact, sandy ***CLAY***. Residual diabase.	
	3,80	Moist, pale light grey mottled light brown, soft, slickensided, clayey ***SILT***. Residual diabase.	
	4,80	Dark grey mottled dark yellow on discontinuities, stiff, relic jointed, clayey ***SILT***. Residual diabase.	▽
+ + + + + + + + + + + +	5,20	Pale light green mottled black, stiff, relic jointed, sandy ***SILT***. Residual diabase.	
	5,80	Dark yellow mottled black stained black on discontinuities, very closely fractured, very fine grained, highly weathered, soft rock to medium hard rock, ***DIABASE***. Discontinuities are open, rough and filled with yellow sand.	

▽	Water encountered / Water teëgekom
▼	Water level / Watervlak
⌊⌋	Bottom of hole / Bodem van gat
---	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie-monster
I	Indicator tests

Contractor: / Kontrakteur:	Frankipile
Date Drilled: / Datum Geboor:	13 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 5800mm on bard rock, diabase.

2 Seepage encountered at 900mm and between 4800mm and 5200mm.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 1**	**FIG B1**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: AWEGAAR: 2	SHEET No: Vel Nr: 1
SITE: TERREIN:	Southern Perimeter	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 3 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 40' 23,2" S 27° 49' 56,5" E

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m	Sample Monster
	FILL : Consisting of slag, ash, various steel fragments etc.	
	0,50	
	Slightly moist, light yellow, loose, intact, silty ***SAND***. Fine colluvium.	
	0,80	
	Abundant clast supported, angular, ***COBBLES*** of sandstone in a matrix of slightly moist, dark brown, silty sand. Overall consistency is dense. Residual quartzitic sandstone.	
	1,20	
	Abundant clast supported, angular, ***COBBLES*** of sandstone in a matrix of slightly moist, dark red brown, silty sand. Overall consistency is very dense. Residual quartzitic sandstone.	
	1,60	

SZ	Water encountered / Water teëgekom
▼	Water level / Watervlak
	Bottom of hole / Bodem van gat
----	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: Kontrakteur:	Frankipile
Date Drilled: Datum Geboor:	13 March 2002
Machine: Masjien:	Williams Digger 11
Hole diameter: Gat deursnee:	750mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 1600mm on hard rock, quartzitic sandstone.

2 Seepage takes place through sandy soil matrix between 800mm and 1600mm.

SOIL KRAFT	SOIL PROFILE : AUGER HOLE 2	FIG B2

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR:	3
SITE: / TERREIN:	Southern Perimeter	SHEET No: / Vel Nr:	1
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOGGED BY: / BESKRYF:	FJB
		DATE: / DATUM:	4 April 2002
		LOCATION: / POSISIE:	26° 39' 23,1" S 27° 50' 33,3" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		Moist becoming very moist at depth, dark yellow grey, loose, intact, silty ***SAND***. Fine colluvium.	
	1,20	Abundant clast supported, rounded, medium coarse, ***GRAVELS*** of ferricrete and subangular and angular ***COBBLES*** of quartzite in a matrix of wet, dark yellow grey, silty sand. Overall consistency is very loose. Pebblestone marker.	
	1,80	Abundant clast supported rounded ***COBBLES*** of quartz, quartzite and chert in a matrix of slightly moist, dark red brown, ferruginized cemented, silty sand. Overall consistency is very dense. Quaternary gravels.	
	3,00		

Water encountered / Water teëgekom	
Water level / Waterrusvlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie-monster	
I Indicator tests	

Contractor: / Kontrakteur:	Frankipile
Date Drilled: / Datum Geboor:	13 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 3000mm on very dense ferruginized quaternary gravels.

2 Seepage encountered between 1200mm and 1800mm.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 3**	**FIG B3**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR:	4
SITE: / TERREIN:	Proposed New Waste Site	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 38' 31,8" S 27° 49' 08,4" E
		SHEET No: / Vel Nr:	1
		DATE: / DATUM:	4 April 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m		Sample / Monster
	0,50	***FILL*** : Consisting of ash, coal etc.	
	1,60	Abundant, clast supported, medium coarse, subrounded, ***GRAVELS*** of ferricrete and rounded ***COBBLES*** of quartzite in a matrix of very moist, light yellow grey, silty sand. Ferruginized fine colluvium.	
	3,10	Abundant, clast supported, medium coarse, subrounded, ***GRAVELS*** of ferricrete and rounded ***COBBLES*** of quartzite in a matrix of wet, light grey green, silty sand. Ferruginized fine colluvium and pebblestone marker.	▽
	4,80	Moist, dark yellow mottled light red stained black on discontinuities, clayey ***SILT***. Residual shale.	▽
	5,00	Dark yellow mottled light red stained black, very fine grained, slightly weathered, soft rock to medium hard rock, ***SHALE***.	
		Hole considered dangerous due to strong influx of water and subsequently not entered. Material descriptions done from samples retrieved from auger flights. Soil consistencies etc therefore disturbed and not described.	

▽	Water encountered / Water teëgekom
▼	Water level / Watermvlak
	Bottom of hole / Bodem van gat
---	Approximate material change / Benaderde materiaalverandering
●	Disturbed sample / Versteurde monster
■	Undisturbed sample / Onversteurde monster
C	Consolidation sample / Konsolidasie monster
I	Indicator tests

Contractor: / Kontrakteur:	Franki pile
Date Drilled: / Datum Geboor:	13 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 5000mm on medium hard rock, shale.

2 Strong seepage encountered between 1600mm and 3100mm and at 4800mm.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 4**	**FIG B4**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR:	5
SITE: / TERREIN:	Existing Dams	SHEET No: / Vel Nr:	1
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOGGED BY: / BESKRYF:	FJB
		DATE: / DATUM:	4 April 2002
		LOCATION: / POSISIE:	26° 38' 12,8" S 27° 49' 40,9" E

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Description	Sample / Monster
	1,00	Abundant clast supported, rounded, medium coarse, black, ***GRAVELS*** of ferricrete in a matrix of wet, dark olive, silty sand. Ferruginized fine colluvium. Horizon possibly contaminated with tar.	
	2,00		
	5,00	Abundant clast supported, rounded, medium coarse, dull light red brown, ***GRAVELS*** of ferricrete in a matrix of wet, light red, silty sand. Ferruginized fine colluvium. Horizon possibly contaminated with tar.	
		Very moist, dull light yellow stained black and dark green on discontinuities, relic jointed, sandy ***SILT***. Residual diabase. Horizon possibly contaminated with tar.	
		Moist moist, dull light yellow mottled light red stained black and dark green on discontinuities, relic jointed, sandy ***SILT***. Residual diabase. Horizon possibly contaminated with tar.	
	12,70	Slightly moist, dull light yellow stained black and dark green on discontinuities, relic jointed, sandy ***SILT***. Residual diabase.	
		Hole considered dangerous due to strong influx of water and subsequently not entered. Material descriptions done from samples retrieved from auger flights. Soil consistencies etc therefore disturbed and not described.	

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C — Consolidation sample / Konsolidasie monster	
I — Indicator tests	

Contractor: / Kontrakteur:	Frankipile
Date Drilled: / Datum Geboor:	13 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 12700mm on medium hard rock, diabase.

2 Strong seepage encountered between the surface and 3800mm.

3 Sidewall collapse from surface to 2000mm.

4 All earth materials down to 12700mm smells strongly of tar.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 5**	**FIG B5**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR:	6
SITE: / TERREIN:	Existing Dams	LOGGED BY: / BESKRYF:	FJB
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE:	26° 37' 56,4" S 27° 49' 40,9" E

SHEET No: / Vel Nr: 1

DATE: / DATUM: 4 April 2002

SOIL PROFILE - GRONDPROFIEL

Legend / Legende	Depth / Diepte m	Description	Sample / Monster
	1,00	Abundant clast supported, rounded, medium coarse, black, ***GRAVELS*** of ferricrete in a matrix of wet, dark olive, silty sand. Ferruginized fine colluvium. Horizon possibly contaminated with tar.	
	2,00		
	5,00	Abundant clast supported, rounded, medium coarse, dull light red brown, ***GRAVELS*** of ferricrete and quartzite in a matrix of wet, dark yellow, silty sand. Ferruginized fine colluvium. Horizon possibly contaminated with tar.	
		Moist, dark yellow mottled light grey stained black on discontinuities, fissured, sandy ***CLAY***. Residual diabase.	
		Slightly moist, dark yellow speckled white stained black on discontinuities, relic jointed, sandy ***SILT***. Residual diabase.	
	18,00	Hole considered dangerous due to strong influx of water and subsequently not entered. Material descriptions done from samples retrieved from auger flights. Soil consistencies etc therefore disturbed and not described.	

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Frankipile
Date Drilled: / Datum Geboor:	13 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 18000mm on medium hard rock, diabase.

2 Strong seepage encountered between 1300mm and 2900mm.

3 All earth materials down to 18000mm smells strongly of tar.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 6**	**FIG B6**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: AWEGAAR:	7
SITE: TERREIN:	North Western Perimeter	SHEET No: Vel Nr:	1
CLIENT: KLIENT:	Van Renssen & Fortuin	LOGGED BY: BESKRYF:	FJB
		DATE: DATUM:	4 April 2002
		LOCATION: POSISIE:	26° 39' 23,6" S 27° 48' 07,3" E

SOIL PROFILE - GRONDPROFIEL

Legend Legende	Depth Diepte m		Sample Monster
	0,60	***FILL*** : Consisting of slightly moist, light yellow grey mottled dark yellow, soft, silty clay. Made ground.	
	3,20	Very moist to wet, light grey, soft to very soft, slickensided, silty ***CLAY***. Residual diabase.	
	3,50	Moist, light grey mottled dark yellow, soft, slickensided, silty ***CLAY***. Residual diabase.	
+ + + +	4,30	Slightly moist, dark yellow mottled light grey, stiff, fissured, silty ***CLAY*** and matrix supported, subrounded, fine, black ferricrete nodules. Residual diabase. Water seeps through fissures.	
+ + + +	6,00	Dark yellow mottled black on discontinuities, closely fractured, fine grained, highly weathered, soft rock to medium hard rock, ***DIABASE***. Discontinuities are open, slightly rough and seepage takes place through them.	

Water encountered Water teëgekom	
Water level Watervlak	
Bottom of hole Bodem van gat	
Approximate material change Benaderde materiaalverandering	
Disturbed sample Versteurde monster	
Undisturbed sample Onversteurde monster	
C Consolidation sample Konsolidasie monster	
I Indicator tests	

Contractor: Kontrakteur:	Frankipile
Date Drilled: Datum Geboor:	14 March 2002
Machine: Masjien:	Williams Digger 11
Hole diameter: Gat deursnee:	750mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 6000mm on medium hard rock, diabase.

2 Strong seepage encountered between 600mm and 1000mm, at 3300mm and at 4300mm.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 7**	**FIG B7**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR:	8
SITE: / TERREIN:	North Western Perimeter	SHEET No: / Vel Nr:	1
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOGGED BY: / BESKRYF:	FJB
		DATE: / DATUM:	4 April 2002
		LOCATION: / POSISIE:	26° 38' 55,4" S 27° 48' 18,1" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		Moist, black, soft, intact, sandy/silty ***CLAY***. Fine colluvium.	
	1,20		
		Moist, light grey streaked black, fissured, silty ***CLAY*** and matrix supported, medium coarse, angular, white calcereous concretions. Residual diabase.	
+ + + + + + + + + + + + + + + +	3,00		
	3,40	Dark yellow mottled black on discontinuities, closely fractured, fine grained, highly weathered, soft rock to medium hard rock, ***DIABASE***. Discontinuities are open, slightly rough and clean.	

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie monster	
I Indicator tests	

Contractor: / Kontrakteur:	Frankipile
Date Drilled: / Datum Geboor:	14 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Waterviak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 3400mm on medium hard rock, diabase.

2 Seepage encountered between 2800mm and 3000mm.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 8**	**FIG B8**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR: 9	SHEET No: / Vel Nr: 1
SITE: / TERREIN:	North Western Perimeter	LOGGED BY: / BESKRYF: FJB	DATE: / DATUM: 4 April 2002
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOCATION: / POSISIE: 26° 37' 52,3" S 27° 49' 04,1" E	

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
		FILL : Consisting of large fragments of slag (500mm Ø) in a matrix of dark grey, fine powder slag. Made ground.	
	1,60		
	2,00	Very moist, dark grey, sandy/silty ***CLAY***. Fine colluvium.	
	3,00	Moist, pale light grey, fissured, silty ***CLAY*** and matrix supported, coarse, subrounded, white, calcereous concretions. Residual diabase.	
	4,00	Moist, pale light grey mottled black and light brown, slickensided, silty ***CLAY***. Residual diabase.	
	5,00	Slightly moist, dark yellow brown mottled black, intact, silty ***SAND***. Residual diabase.	
		Hole considered dangerous due to continuous collapse of surface horizon and subsequently not entered. Material descriptions done from samples retrieved from auger flights. Soil consistencies etc. therefore disturbed and not described.	

Water encountered / Water teëgekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalverandering	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
Consolidation sample / Konsolidasie monster	C
Indicator tests	I

Contractor: / Kontrakteur:	Frankipile
Date Drilled: / Datum Geboor:	14 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 5000mm on very dense silty sand.

2 No seepage encountered.

3 Surface horizon of slag is very loose and collapse of borehole sidewalls takes place.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 9**	**FIG B9**

PROJECT: PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: AWEGAAR: 10	SHEET No: Vel Nr: 1
SITE: TERREIN:	North Western Perimeter	LOGGED BY: BESKRYF: FJB	DATE: DATUM: 6 April 2002
CLIENT: KLIENT:	Van Renssen & Fortuin	LOCATION: POSISIE:	26° 37' 55,4" S 27° 48' 32,6" E

Legend Legende	Depth Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample Monster
	0,20	***FILL*** : Consisting of fine, granulae ash. Made ground.	
	0,40		
	0,80	Moist, light grey, loose, intact, silty ***SAND***. Fine colluvium.	
		Moist, light yellow grey, firm , intact, sandy ***CLAY***. Residual diabase.	
	2,70	Moist, pale light grey, mottled dark yellow, firm, intact, silty ***CLAY*** and matrix supported, fine rounded, ferricrete nodules. Residual diabase.	
	3,90	Slightly moist, light brown yellow stained black on discontinuities, dense, relic jointed, silty ***SAND***. Residual diabase.	
	4,90	Moist, pale light grey, mottled dark yellow, stiff, intact, silty ***CLAY*** and matrix supported, fine rounded, ferricrete nodules. Residual diabase.	
	5,50	Light brown stained black on fractures, closely fractured, fine grained, medium weathered, soft rock becoming medium hard rock, ***DIABASE***. Discontinuities are open, rough and clean.	

Water encountered Water teëgekom	
Water level Waterrusvlak	
Bottom of hole Bodem van gat	
Approximate material change Benaderde materiaalverandering	
Disturbed sample Versteurde monster	
Undisturbed sample Onversteurde monster	
Consolidation sample Konsolidasie monster	C
Indicator tests	I

Contractor: Kontrakteur:	Frankipile
Date Drilled: Datum Geboor:	14 March 2002
Machine: Masjien:	Williams Digger 11
Hole diameter: Gat deursnee:	750mm
Water depth: Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 5500mm on medium hard rock, diabase.

2 No seepage encountered.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 10**	**FIG B10**

PROJECT: / PROJEK:	Master Plan for Pollution Control - Iscor Vanderbijl Park	AUGER HOLE: / AWEGAAR:	11
SITE: / TERREIN:	Southeastern Perimeter	SHEET No: / Vel Nr:	1
CLIENT: / KLIENT:	Van Renssen & Fortuin	LOGGED BY: / BESKRYF:	FJB
		DATE: / DATUM:	4 April 2002
		LOCATION: / POSISIE:	26° 39' 00,0" S 27° 50' 51,9" E

Legend / Legende	Depth / Diepte m	SOIL PROFILE - GRONDPROFIEL	Sample / Monster
	0,30	Very moist, dark grey brown, very loose, intact, silty ***SAND***. Fine colluvium.	
	0,90	Very moist, dark grey brown, medium dense, intact, silty ***SAND*** and matrix supported, rounded, medium coarse, gravels of ferricrete. Ferruginized fine colluvium.	
	2,00	Abundant clast supported, rounded, fine, black ***GRAVELS*** of ferricrete and angular to rounded ***COBBLES*** of quartz, quartzite and chert in a matrix of very moist, dark brown, silty sand. Overall consistency is dense. Reworked quaternary gravels.	
	2,70	Abundant clast supported rounded ***COBBLES*** of quartz, quartzite and chert in a matrix of slightly moist, dark red brown, ferruginized cemented, silty sand. Overall consistency is very dense. Ferruginized quaternary gravels.	

Water encountered / Water teëngekom	
Water level / Watervlak	
Bottom of hole / Bodem van gat	
Approximate material change / Benaderde materiaalveranderings	
Disturbed sample / Versteurde monster	
Undisturbed sample / Onversteurde monster	
C Consolidation sample / Konsolidasie-monster	
I Indicator tests	

Contractor: / Kontrakteur:	Frankipile
Date Drilled: / Datum Geboor:	14 March 2002
Machine: / Masjien:	Williams Digger 11
Hole diameter: / Gat deursnee:	750mm
Water depth: / Watervlak:	

NOTES / NOTAS

1 Refusal of drilling encountered at 2700mm on very dense ferruginized quaternary gravels.

2 Seepage encountered between surface and 2000mm.

SOIL KRAFT	**SOIL PROFILE : AUGER HOLE 11**	**FIG B11**

ISCOR FLAT STEEL PRODUCTS VANDERBIJL PARK : PROPOSED MASTER PLAN FOR WASTE MANAGEMENT - FINAL GEOTECHNICAL REPORT

9 ADDENDUM C

RESULTS OF DHS PROBING

PENETROMETER RESULTS

ROELF FOURIE
GEOTECHNICAL SERVICES Cell. 082 440 2151

Job No.	RFQ1093/03/02
Project	REHABILITATION OF SILT DAMS
Site	ISCOR V.D.BIJL
Date	4,5,6,11,12,13-03-2002
Done by	HANNES

Remarks :

DEPTH	DPSH 1	DPSH 2	DPSH 3	DPSH 4	DPSH 5	DPSH 6	DPSH 7	DPSH 8	DPSH 9
0.3	10	44	13	29	16	19	75	49	25
0.6	19	43	20	63	14	14	80	42	80 REF.
0.9	80 REF.	39	38	24	24	12	70	30	
1.2		38	76	80 REF.	25	12	80 REF.	25	
1.5		36	58		19	34		29	
1.8		41	46		13	45		9	
2.1		24	28		15	43		7	
2.4		62	80 REF.		67	29		16	
2.7		80 REF.			73	80 REF.		35	
3.0					28			72	
3.3					80 REF.			73	
3.6								80	
3.9								80	
4.2								39	
4.5								30	
4.8								20	
5.1								80 REF.	
5.4									
5.7									
6.0									
6.3									
6.6									
6.9									
7.2									
7.5									
7.8									
8.1									
8.4									
8.7									
9.0									
9.3									
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10.8									
11.1									
11.4									
11.7									
12.0									
12.3									
12.6									
12.9									
13.2									
13.5									
13.8									
14.1									
14.4									
14.7									
15.0									
15.3									
Redrive									
0.3									

'ENETROMETER RESULTS

ROELF FOURIE
GEOTECHNICAL SERVICES Cell. 082 440 2151

ob No.	RFQ1093/03/02
Project	REHABILITATION OF SILT DAMS
Site	ISCOR V.D.BIJL
Date	4,5,6,11,12,13-03-2002
Done by	HANNES

Remarks :

DEPTH	DPSH 10	DPSH 11	DPSH 12	DPSH 13	DPSH 14	DPSH 15	DPSH 16	DPSH 17	DPSH 18
0.3	11	110	16	9	1	1	8	2	1
0.6	20	19	8	28	3	3	33	6	9
0.9	50	18	41	76	3	17	30	39	50
1.2	16	92	48	145	5	80 REF.	58	80 REF.	80 REF.
1.5	80 REF.	50	55	80 REF.	27		80 REF.		
1.8		10	28		80 REF.				
2.1		7	13						
2.4		16	20						
2.7		18	13						
3.0		20	14						
3.3		18	14						
3.6		18	15						
3.9		18	13						
4.2		18	12						
4.5		18	12						
4.8		18	12						
5.1		21	13						
5.4		23	15						
5.7		26	19						
6.0		29	17						
6.3		26	20						
6.6		30	23						
6.9		30	24						
7.2		39	29						
7.5		40	32						
7.8		45	33						
8.1		48	36						
8.4		51	36						
8.7		58	39						
9.0		63	41						
9.3		73	46						
9.6		76	53						
9.9		80 REF.	64						
10.2			76						
10.5			80 REF						
10.8									
11.1									
11.4									
11.7									
12.0									
12.3									
12.6									
12.9									
13.2									
13.5									
13.8									
14.1									
14.4									
14.7									
15.0									
Redrive									
0.3									
0.6									

PENETROMETER RESULTS

ROELF FOURIE
GEOTECHNICAL SERVICES Cell. 082 440 2151

Job No.	RFQ1093/03/02
Project	REHABILITATION OF SILT DAMS
Site	ISCOR V.D.BIJL
Date	4,5,6,11,12,13-03-2002
Done by	HANNES

Remarks :

DEPTH	DPSH 19	DPSH 20	DPSH 21	DPSH 22	DPSH 23	DPSH 24	DPSH 25	DPSH 26	DPSH 27
0.3	9	17	6	16	11	17	15	30	27
0.6	20	13	10	15	8	9	18	19	14
0.9	74	3	7	5	3	6	9	8	7
1.2	60	5	12	6	2	5	11	15	13
1.5	80 REF.	4	12	7	2	10	18	27	23
1.8		3	16	8	4	14	24	50	25
2.1		4	22	14	4	13	46	44	23
2.4		39	80 REF.	15	7	13	60	59	31
2.7		22		18	17	23	60	57	26
3.0		8		13	20	22	80 REF.	70	43
3.3		14		22	30	58		80 REF.	47
3.6		26		28	14	63			50
3.9		19		49	31	74			72
4.2		24		62	31	80 REF.			80 REF.
4.5		26		80 REF.	27				
4.8		30			26				
5.1		37			28				
5.4		46			31				
5.7		44			31				
6.0		64			37				
6.3		68			38				
6.6		74			56				
6.9		80 REF.			64				
7.2					75				
7.5					80 REF.				
7.8									
8.1									
8.4									
8.7									
9.0									
9.3									
9.6									
9.9									
10.2									
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12.6									
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13.5									
13.8									
14.1									
14.4									
14.7									
15.0									
Redrive									
0.3									
0.6									

ENETROMETER RESULTS

ROELF FOURIE
GEOTECHNICAL SERVICES Cell. 082 440 2151

ob No.	RFQ1093/03/02
roject	REHABILITATION OF SILT DAMS
ite	ISCOR V.D.BIJL
ate	4,5,6,11,12,13-03-2002
one by	HANNES

Remarks :

DEPTH	DPSH 28	DPSH 29	DPSH 30	DPSH 31	DPSH 32	DPSH 33	DPSH 34	DPSH 35	DPSH 36
0.3	15	30	9	24	24	18	25	16	52
0.6	25	15	4	14	49	14	12	19	24
0.9	40	9	4	8	7	8	4	7	14
1.2	70	14	8	9	16	8	5	7	15
1.5	80 REF.	29	30	46	48	25	11	7	19
1.8		78	60	56	61	20	18	18	48
2.1		80 REF.	44	77	42	24	26	25	53
2.4			61	80 REF.	80 REF.	17	28	44	60
2.7			80 REF.			16	31	57	80 REF.
3.0						19	38	80 REF.	
3.3						17	30		
3.6						21	28		
3.9						80 REF.	36		
4.2							59		
4.5							80 REF.		
4.8									
5.1									
5.4									
5.7									
6.0									
6.3									
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7.2									
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12.9									
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13.8									
14.1									
14.4									
14.7									
15.0									
Redrive									
0.3									
0.6									

PENETROMETER RESULTS	KOELF FOURIE GEOTECHNICAL SERVICES Cell. 082 440 21

Job No.	RFQ1093/03/02	Remarks :
Project	REHABILITATION OF SILT DAMS	
Site	ISCOR V.D.BIJL	
Date	4,5,6,11,12,13-03-2002	
Done by	HANNES	

DEPTH	DPSH 37	DPSH 38	DPSH 39	DPSH 40	DPSH 41	DPSH 42	DPSH 43	DPSH 44	DPSH 45
0.3	14	9	13	1	10	26	33	166	100
0.6	15	6	6	2	5	13	8	REF.	120
0.9	5	19	7	2	5	80 REF.	14		REF.
1.2	8	37	6	4	7		15		
1.5	20	80 REF.	5	7	8		12		
1.8	20		5	12	15		12		
2.1	44		24	25	18		9		
2.4	38		38	72	18		13		
2.7	43		46	80 REF.	14		18		
3.0	62		44		14		20		
3.3	49		52		28		35		
3.6	48		57		26		80 REF.		
3.9	80 REF.		51		80 REF.				
4.2			58						
4.5			44						
4.8			25						
5.1			26						
5.4			28						
5.7			23						
6.0			25						
6.3			25						
6.6			80 REF.						
6.9									
7.2									
7.5									
7.8									
8.1									
8.4									
8.7									
9.0									
9.3									
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10.8									
11.1									
11.4									
11.7									
12.0									
12.3									
12.6									
12.9									
13.2									
13.5									
13.8									
14.1									
Redrive									
0.3									
0.6									

PENETROMETER RESULTS

ROELF FOURIE
GEOTECHNICAL SERVICES Cell. 082 440 21

Job No.	RFQ1093/03/02
Project	REHABILITATION OF SILT DAMS
Site	ISCOR V.D.BIJL
Date	4,5,6,11,12,13-03-2002
Done by	HANNES

Remarks :

DEPTH	DPSH 46	DPSH 47	DPSH 48	DPSH 49	DPSH 50	DPSH 51	DPSH 52	DPSH 53	DPSH 54
0.3	11	100	120	160	180	63	69	88	44
0.6	6	41	105	110	REF.	25	30	34	22
0.9	4	7	68	52		16	13	45	32
1.2	16	4	80 REF.	40		25	18	16	27
1.5	9	12		28		54	33	16	14
1.8	5	33		80 REF.		20	28	48	15
2.1	7	45				14	44	80 REF.	10
2.4	12	80 REF.				50	80 REF.		80 REF.
2.7	28					42			
3.0	33					31			
3.3	31					80 REF.			
3.6	25								
3.9	20								
4.2	19								
4.5	19								
4.8	19								
5.1	24								
5.4	20								
5.7	28								
6.0	30								
6.3	27								
6.6	39								
6.9	40								
7.2	40								
7.5	42								
7.8	42								
8.1	40								
8.4	43								
8.7	40								
9.0	41								
9.3	43								
9.6	49								
9.9	40								
10.2	47								
10.5	80 REF.								
10.8									
11.1									
11.4									
11.7									
12.0									
12.3									
12.6									
12.9									
13.2									
13.5									
13.8									
14.1									
14.4									
14.7									
15.0									
15.3									
Redrive									
0.3									
0.6									

PENETROMETER RESULTS

ROELF FOURIE
GEOTECHNICAL SERVICES Cell. 082 440 21

Job No.	RFQ1093/03/02
Project	REHABILITATION OF SILT DAMS
Site	ISCOR V.D.BIJL
Date	4,5,6,11,12,13-03-2002
Done by	HANNES

Remarks :

DEPTH	DPSH 55	DPSH 56							
0.3	69	48							
0.6	31	29							
0.9	14	33							
1.2	25	63							
1.5	51	59							
1.8	80 REF.	64							
2.1		80 REF.							
2.4									
2.7									
3.0									
3.3									
3.6									
3.9									
4.2									
4.5									
4.8									
5.1									
5.4									
5.7									
6.0									
6.3									
6.6									
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7.2									
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8.1									
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8.7									
9.0									
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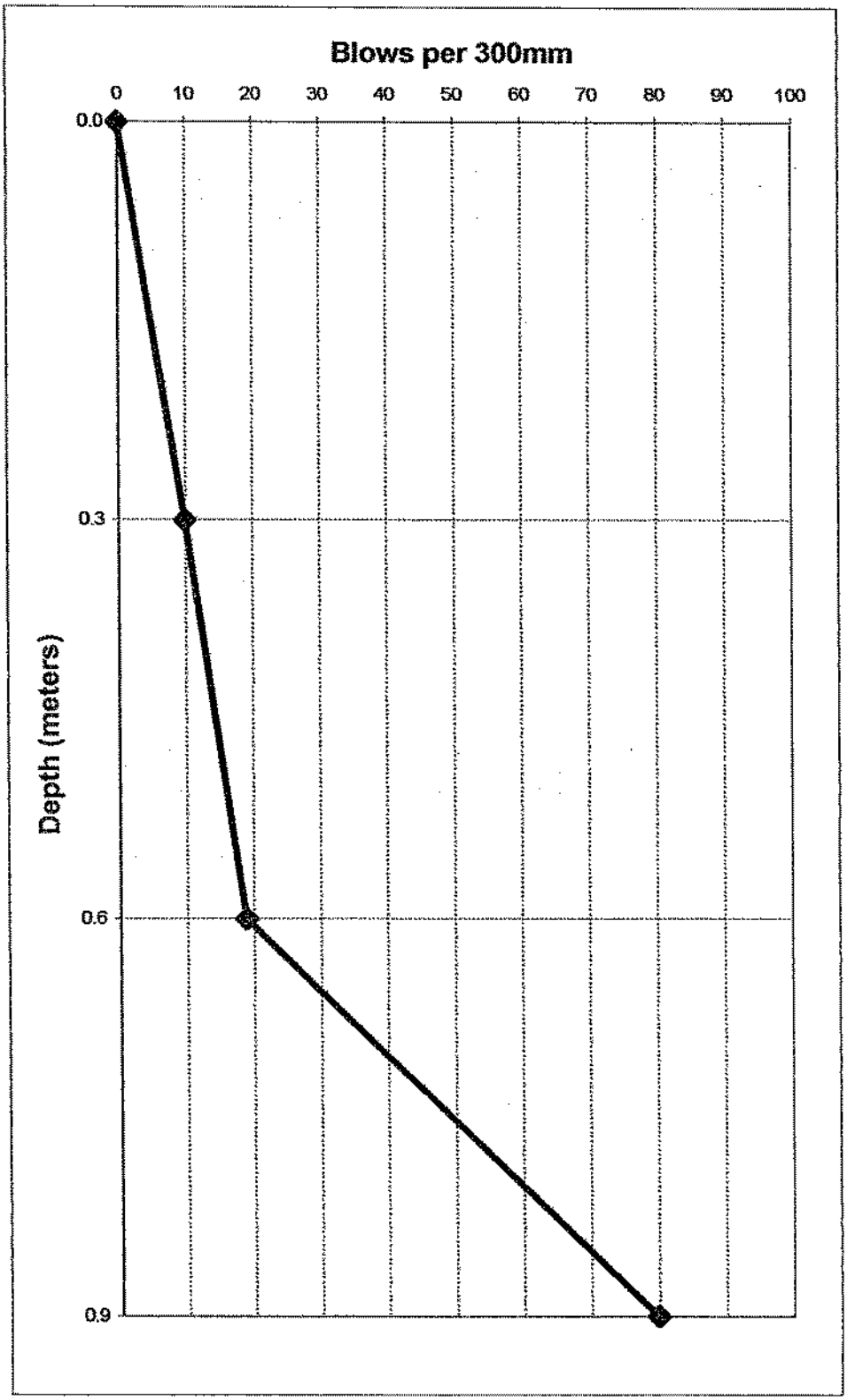
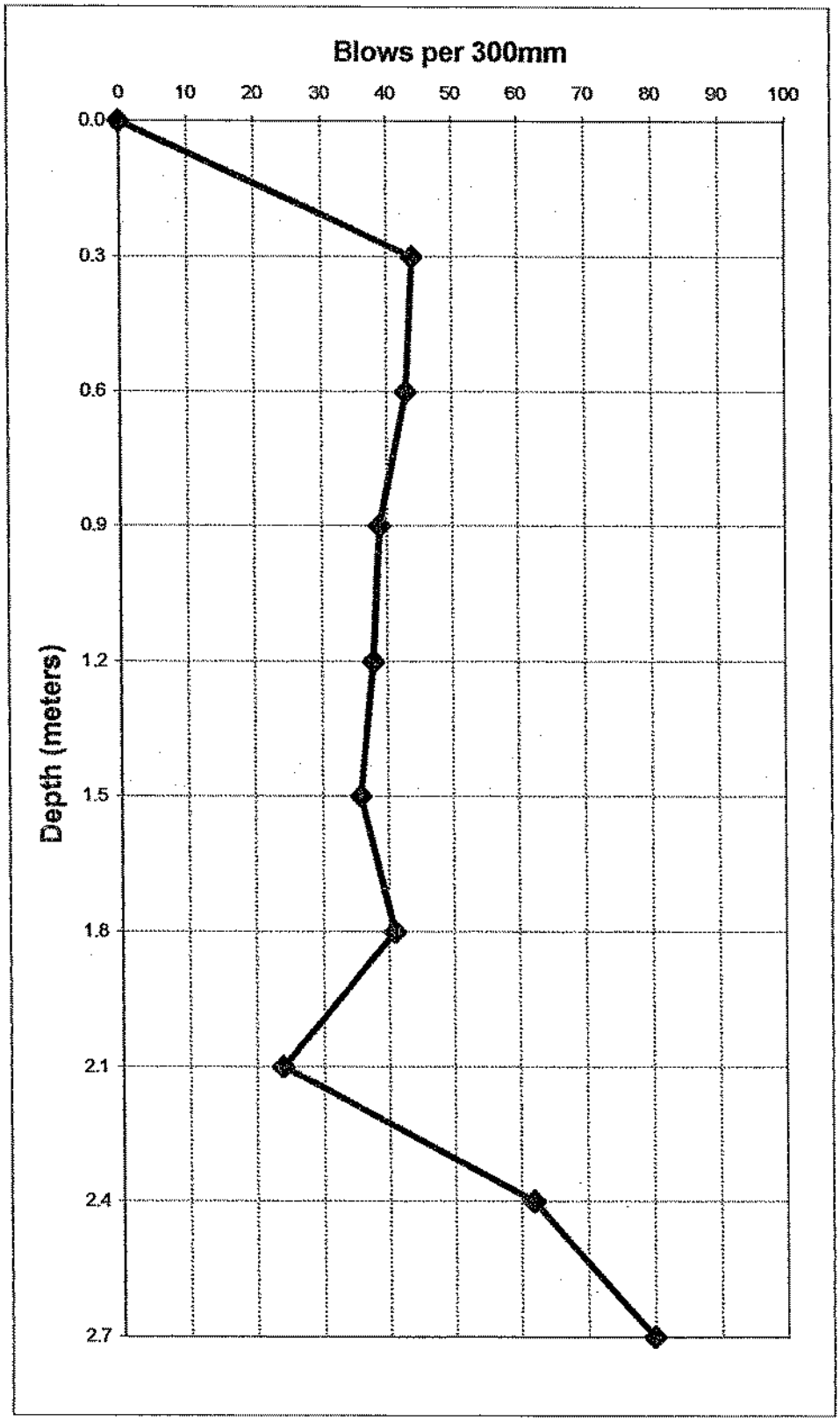
9.6									
9.9									
10.2									
10.5									
10.8									
11.1									
11.4									
11.7									
12.0									
12.3									
12.6									
12.9									
13.2									
13.5									
13.8									
Redrive									
0.3									
0.6									



SOIL KRAFT

PENETRATION CURVE : DHSPT 1

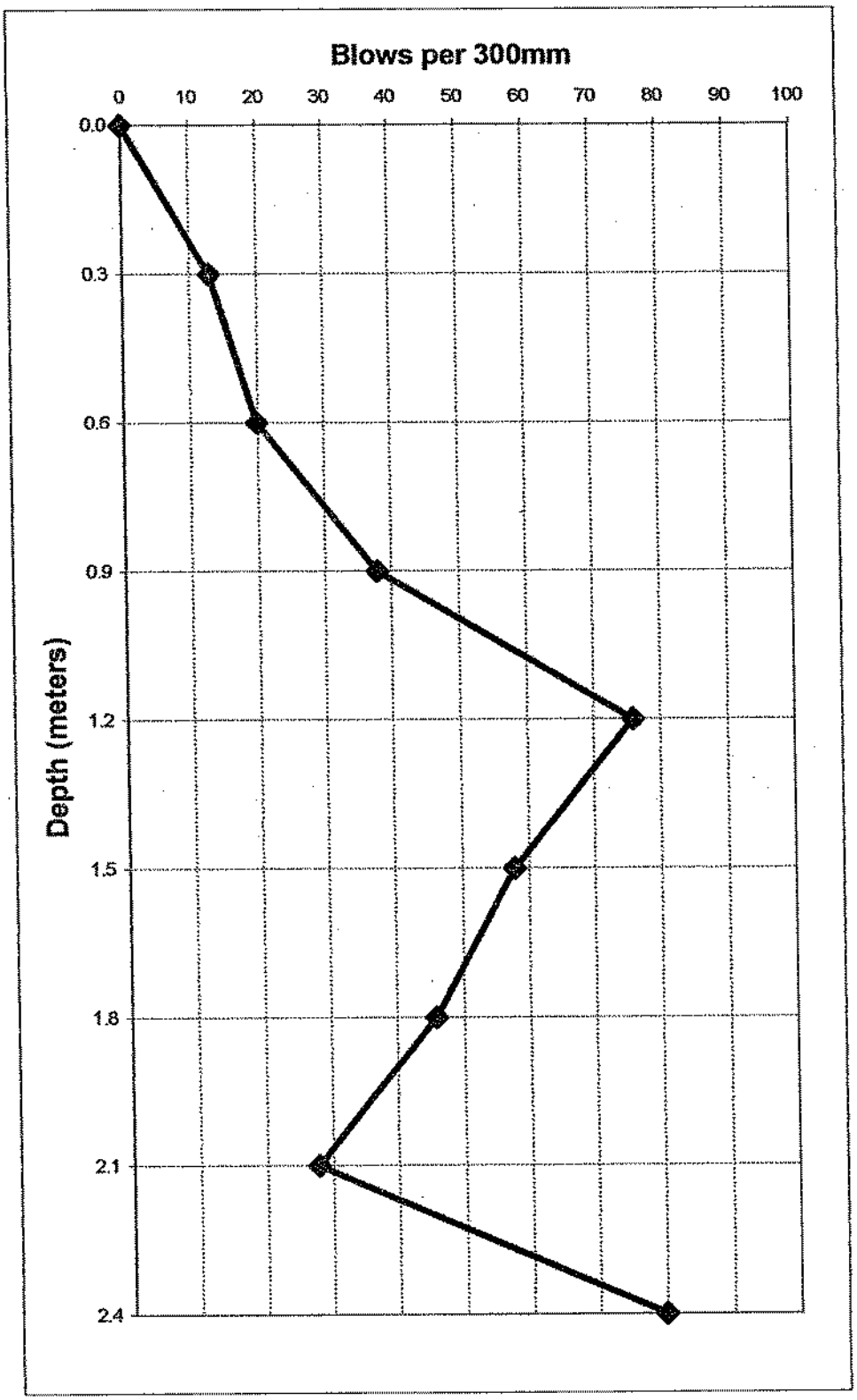
FIGURE C1



SOIL KRAFT

PENETRATION CURVE : DHSPT 2

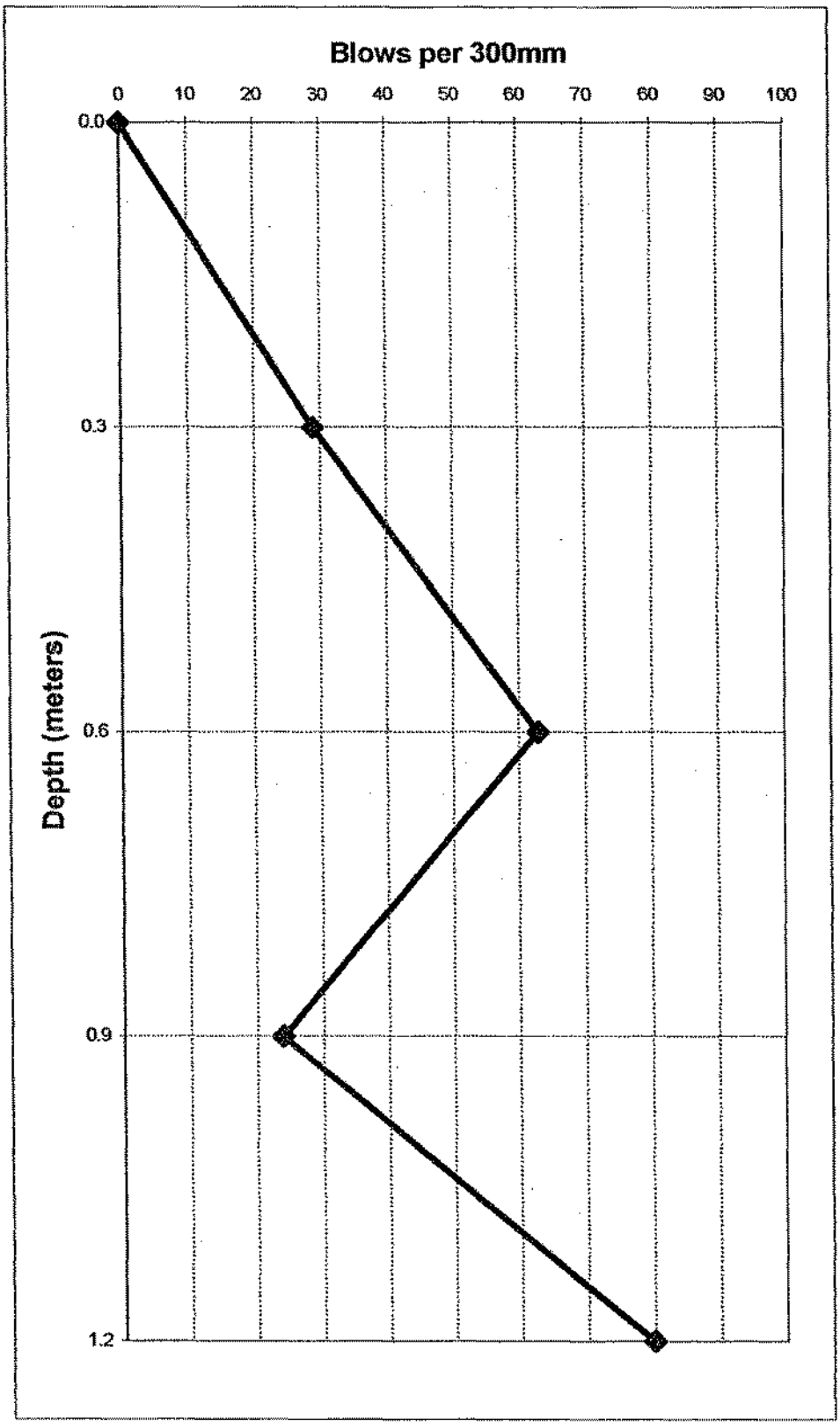
FIGURE C2



SOIL KRAFT

PENETRATION CURVE : DHSPT 3

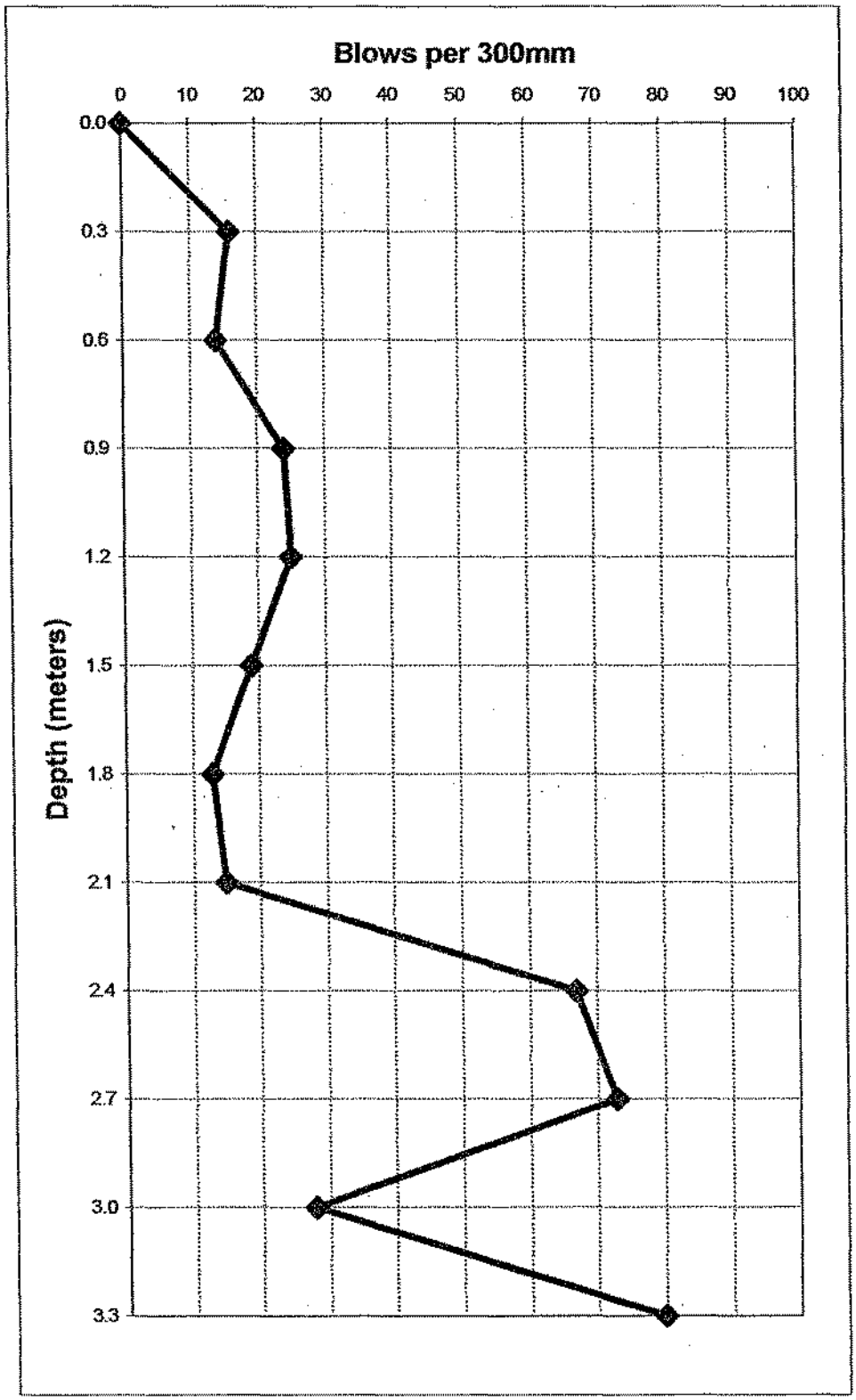
FIGURE C3



SOIL KRAFT

PENETRATION CURVE : DHSPT 4

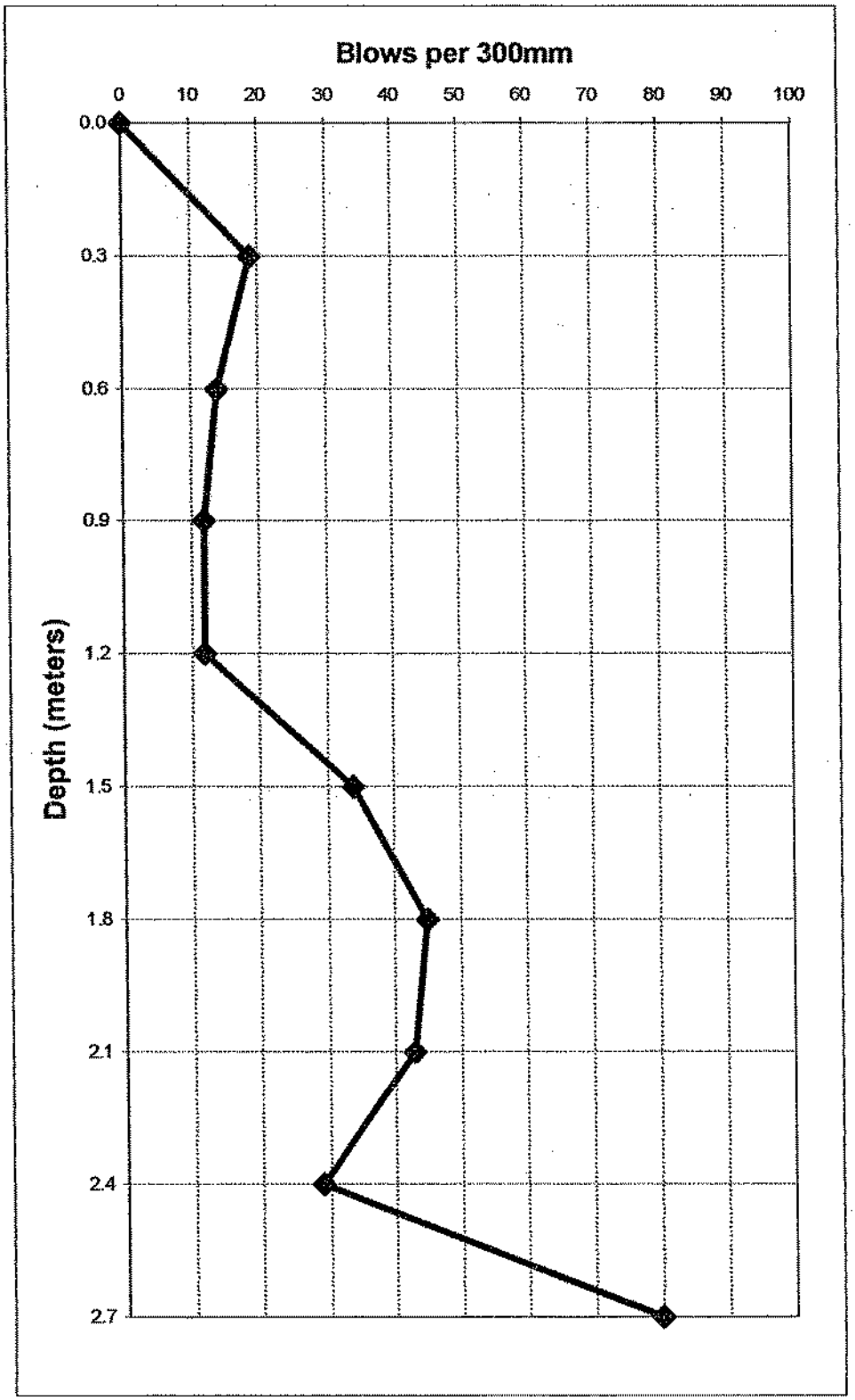
FIGURE C4



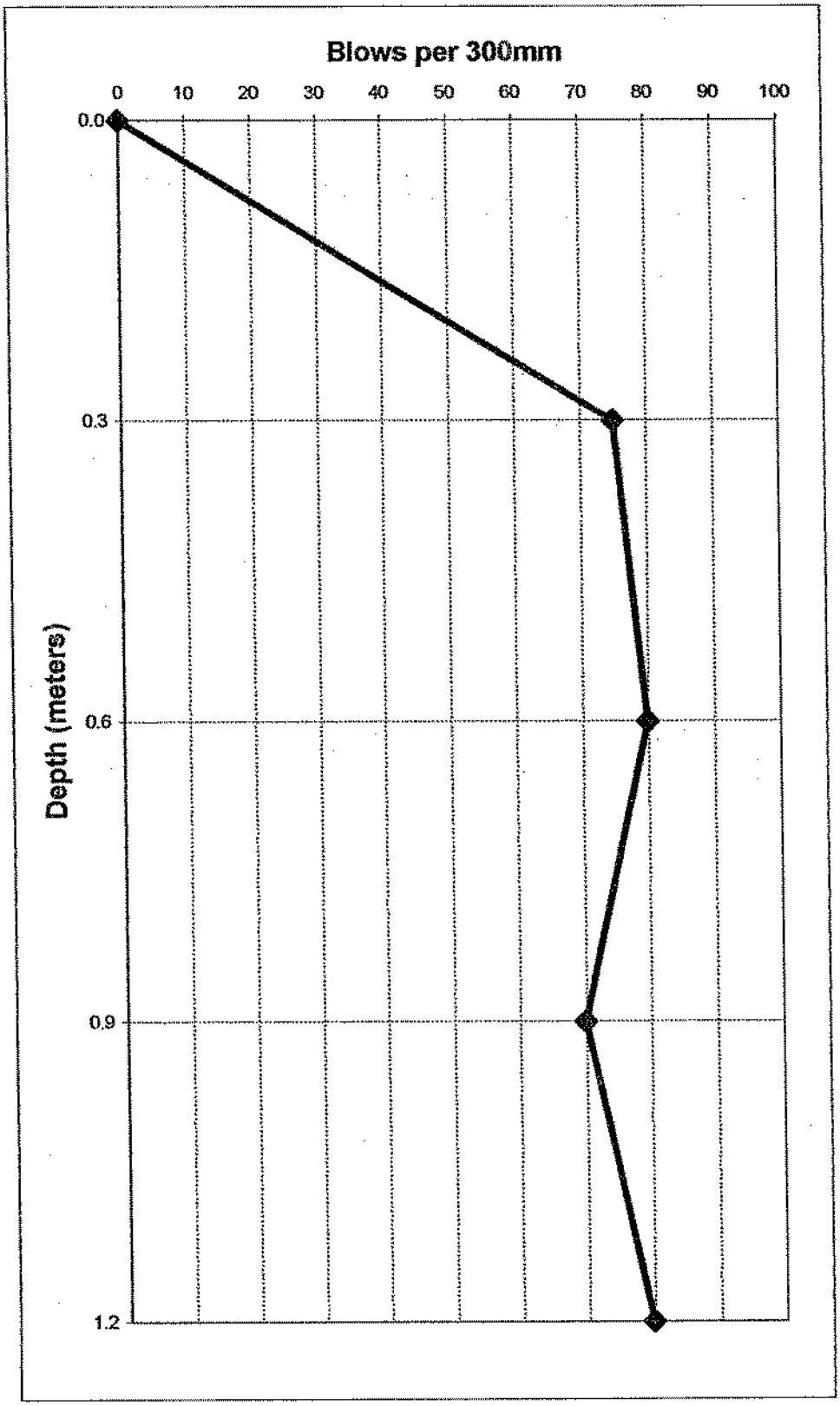
SOIL KRAFT

PENETRATION CURVE : DHSPT 5

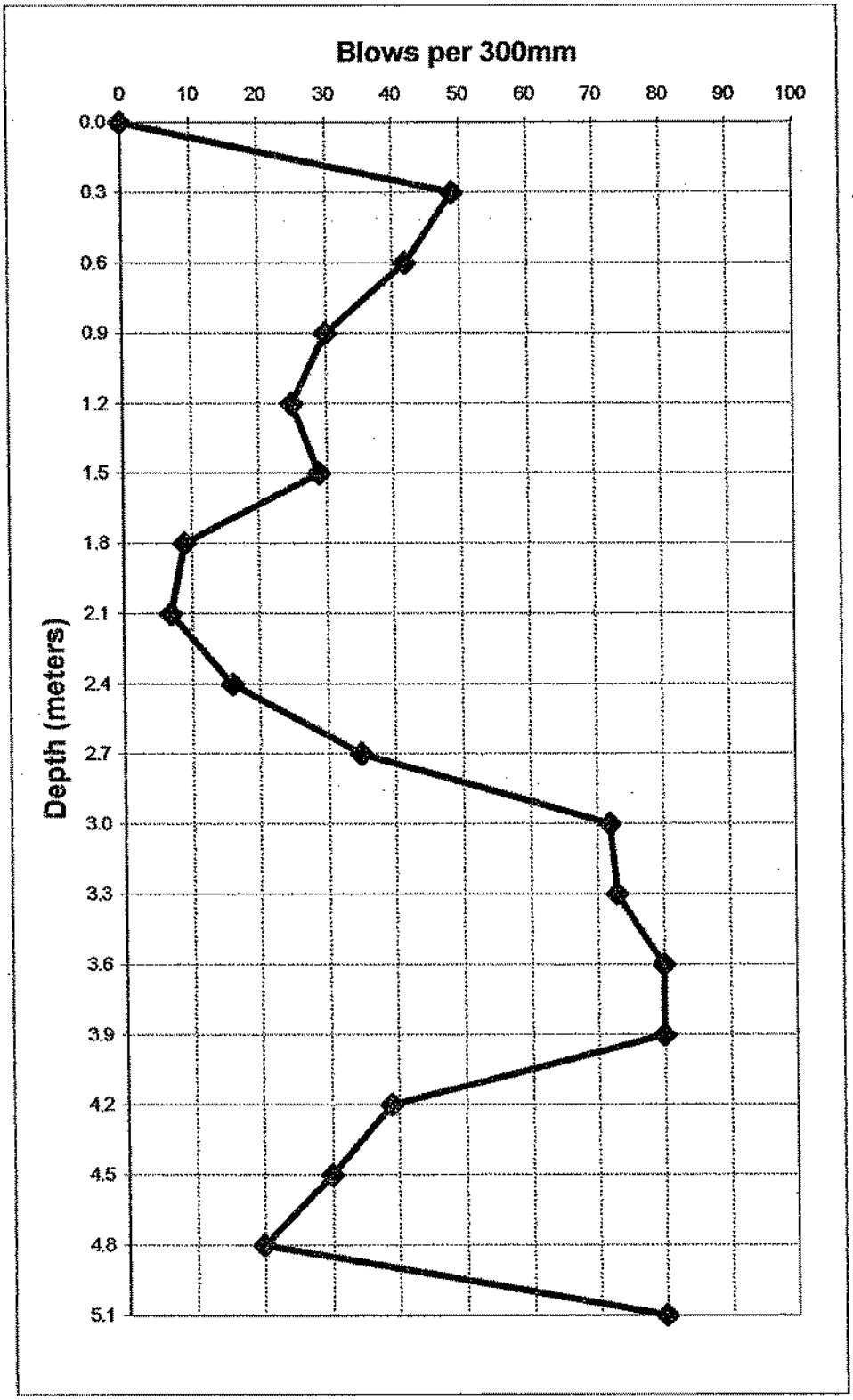
FIGURE C5



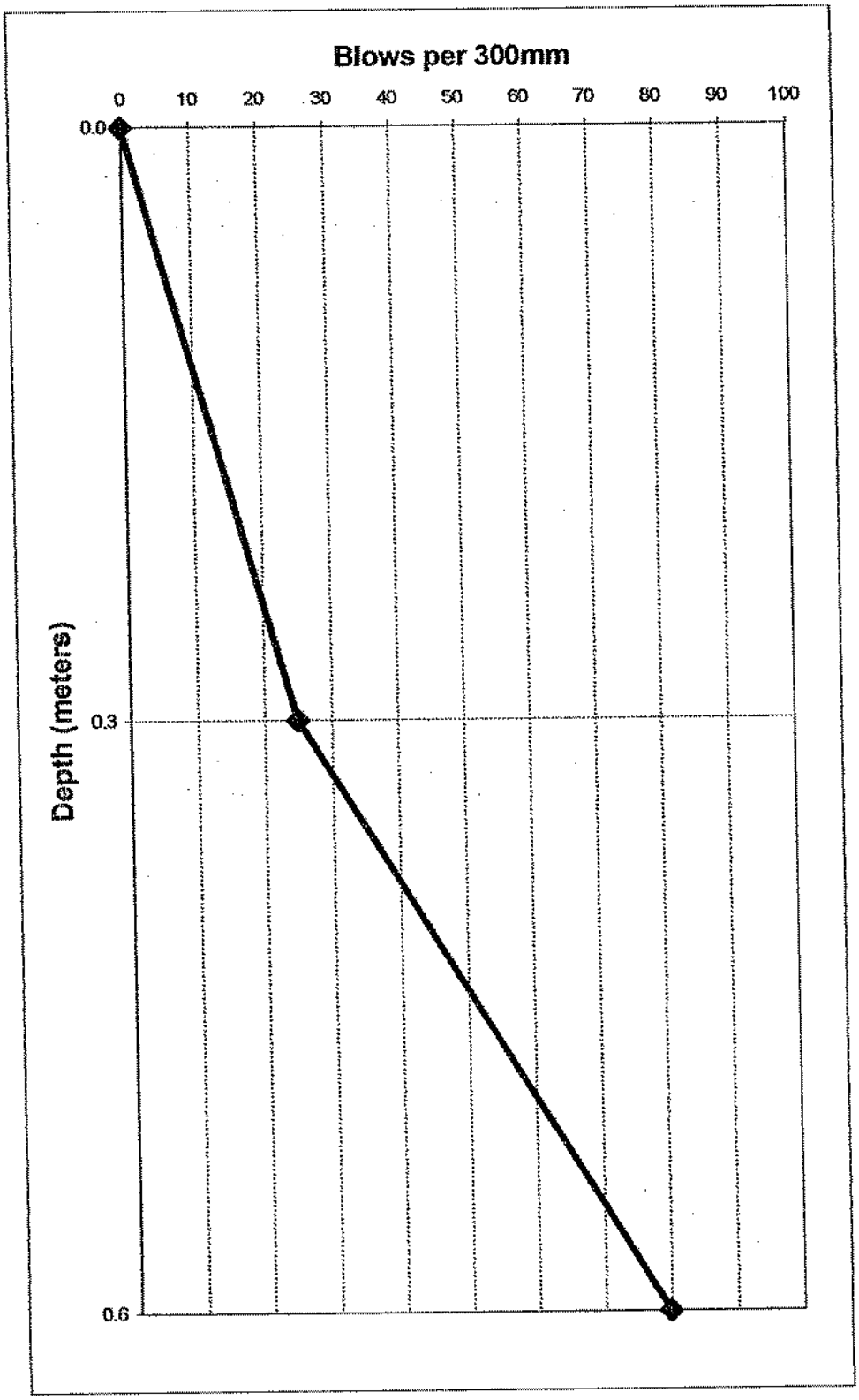
SOIL KRAFT	PENETRATION CURVE : DHSPT 6	FIGURE C6



SOIL KRAFT	**PENETRATION CURVE : DHSPT 7**	**FIGURE C7**



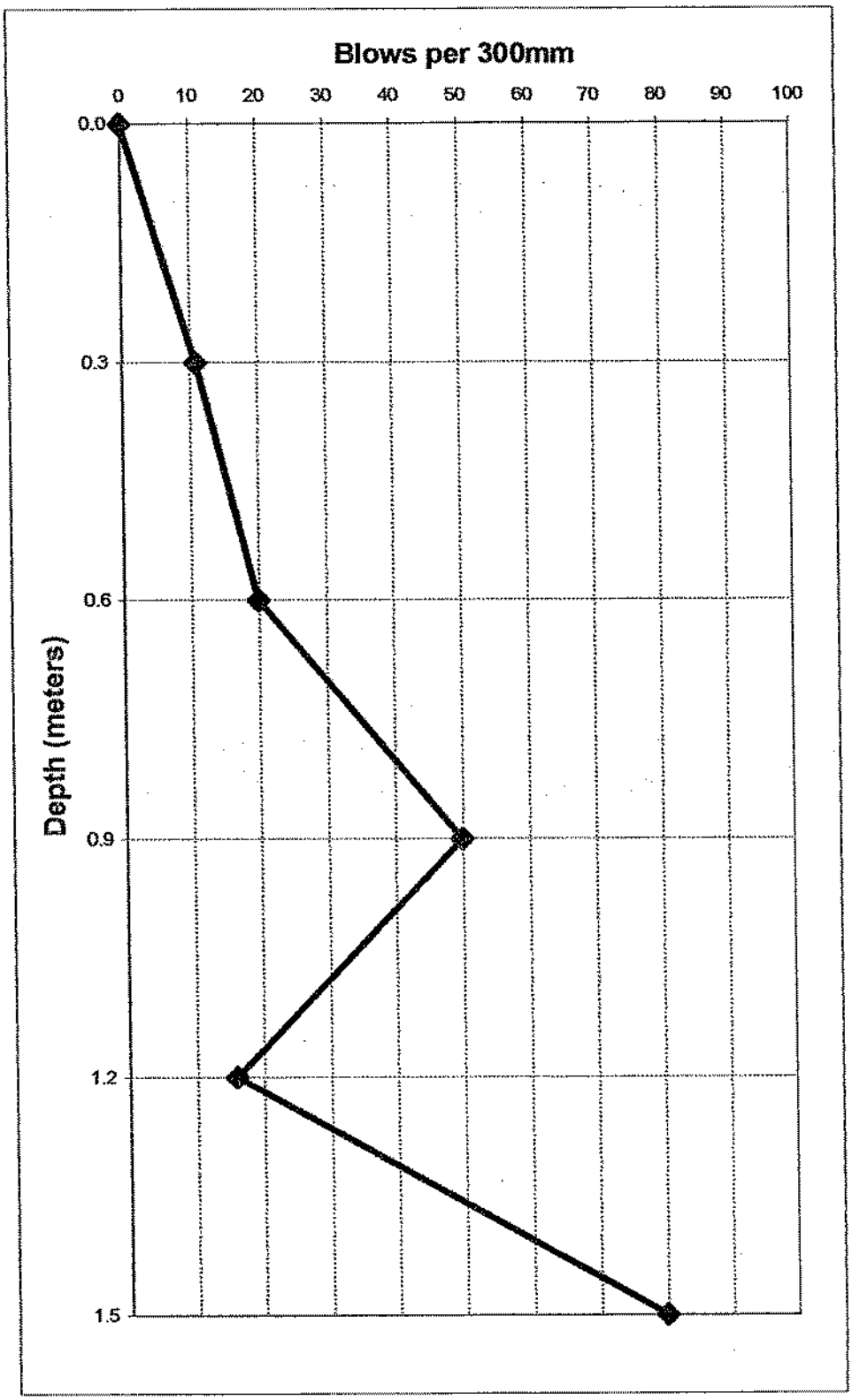
SOIL KRAFT	PENETRATION CURVE : DHSPT 8	FIGURE C8



SOIL KRAFT

PENETRATION CURVE : DHSPT 9

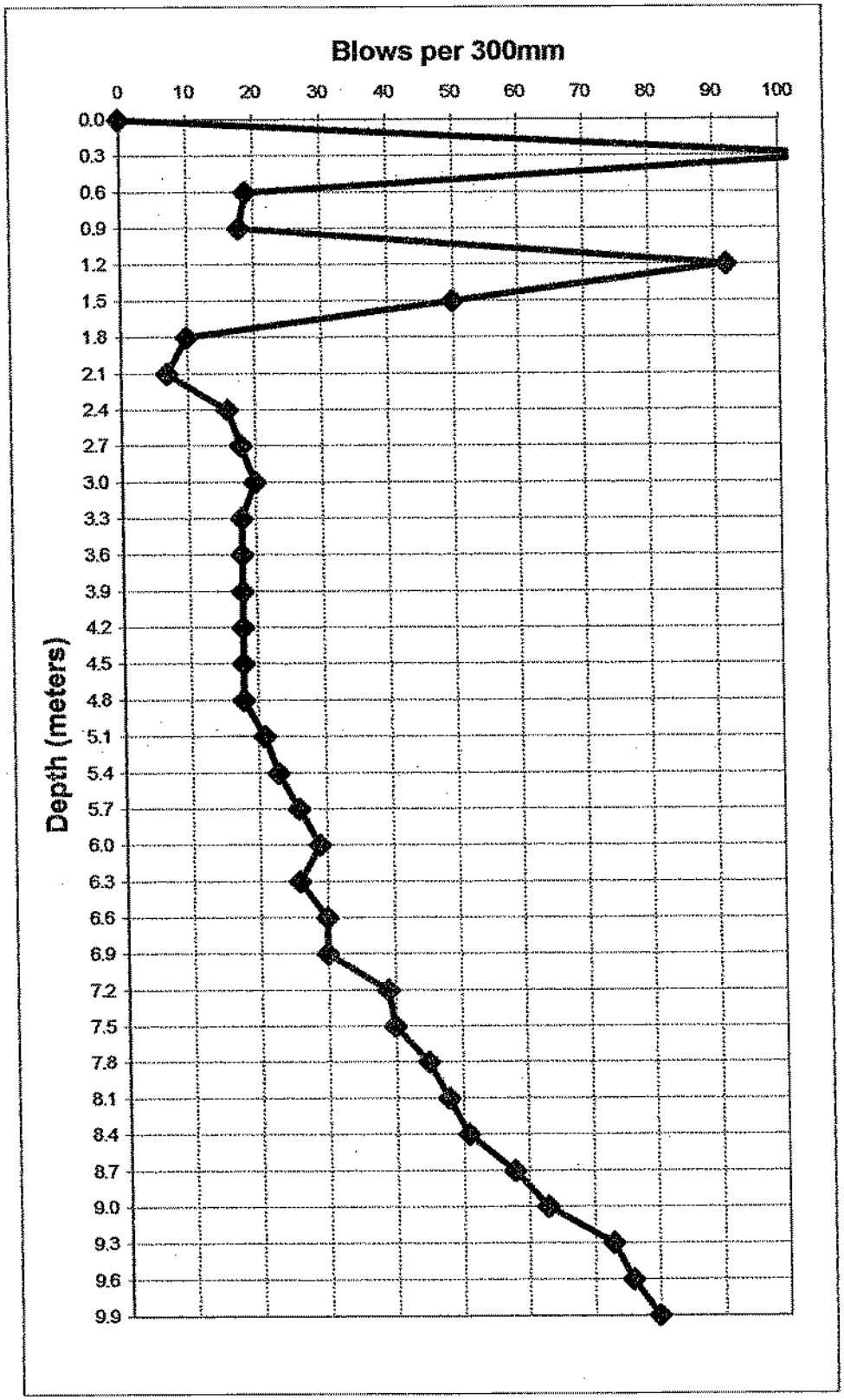
FIGURE C9



SOIL KRAFT

PENETRATION CURVE : DHSPT 10

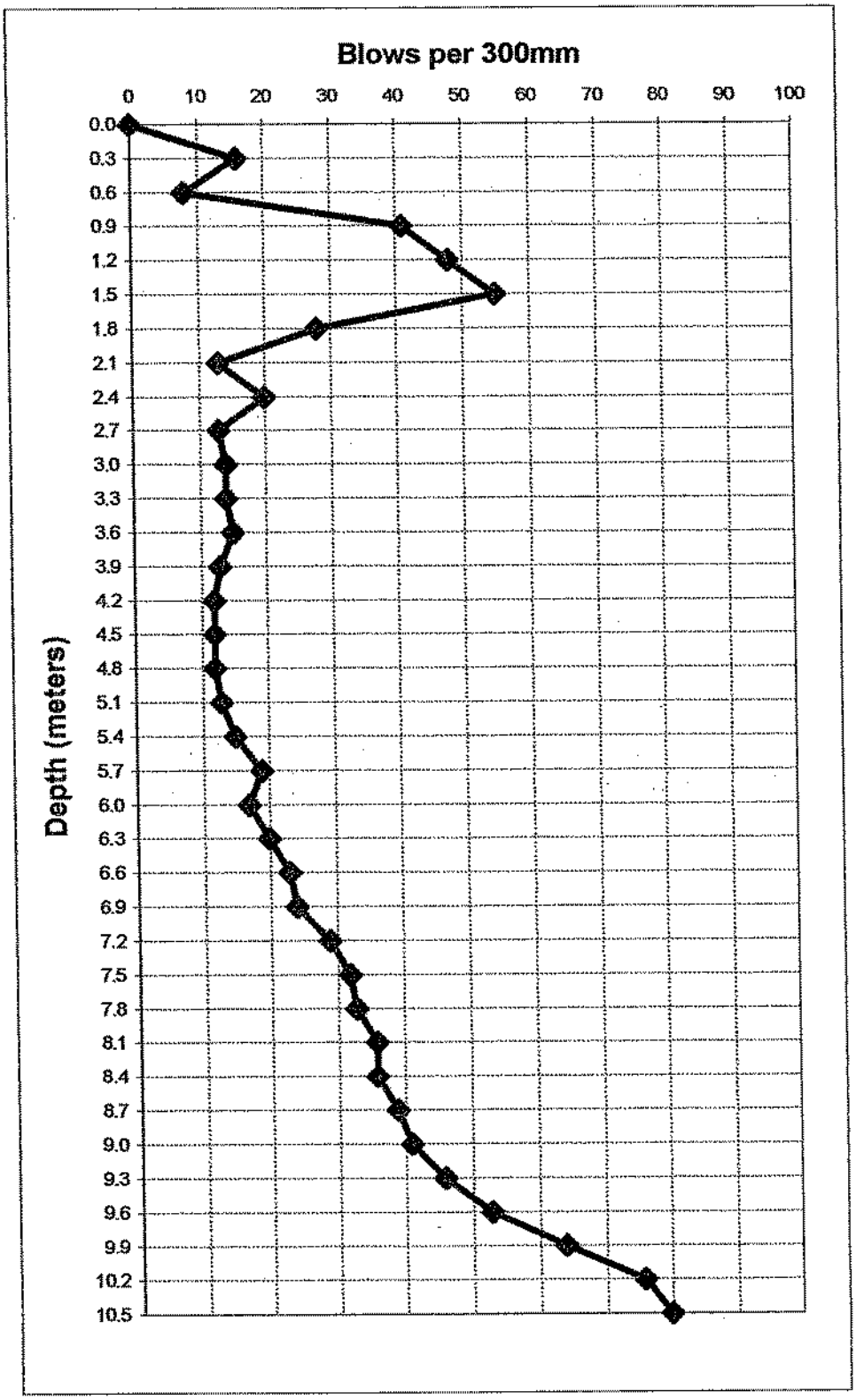
FIGURE C10



SOIL KRAFT

PENETRATION CURVE : DHSPT 11

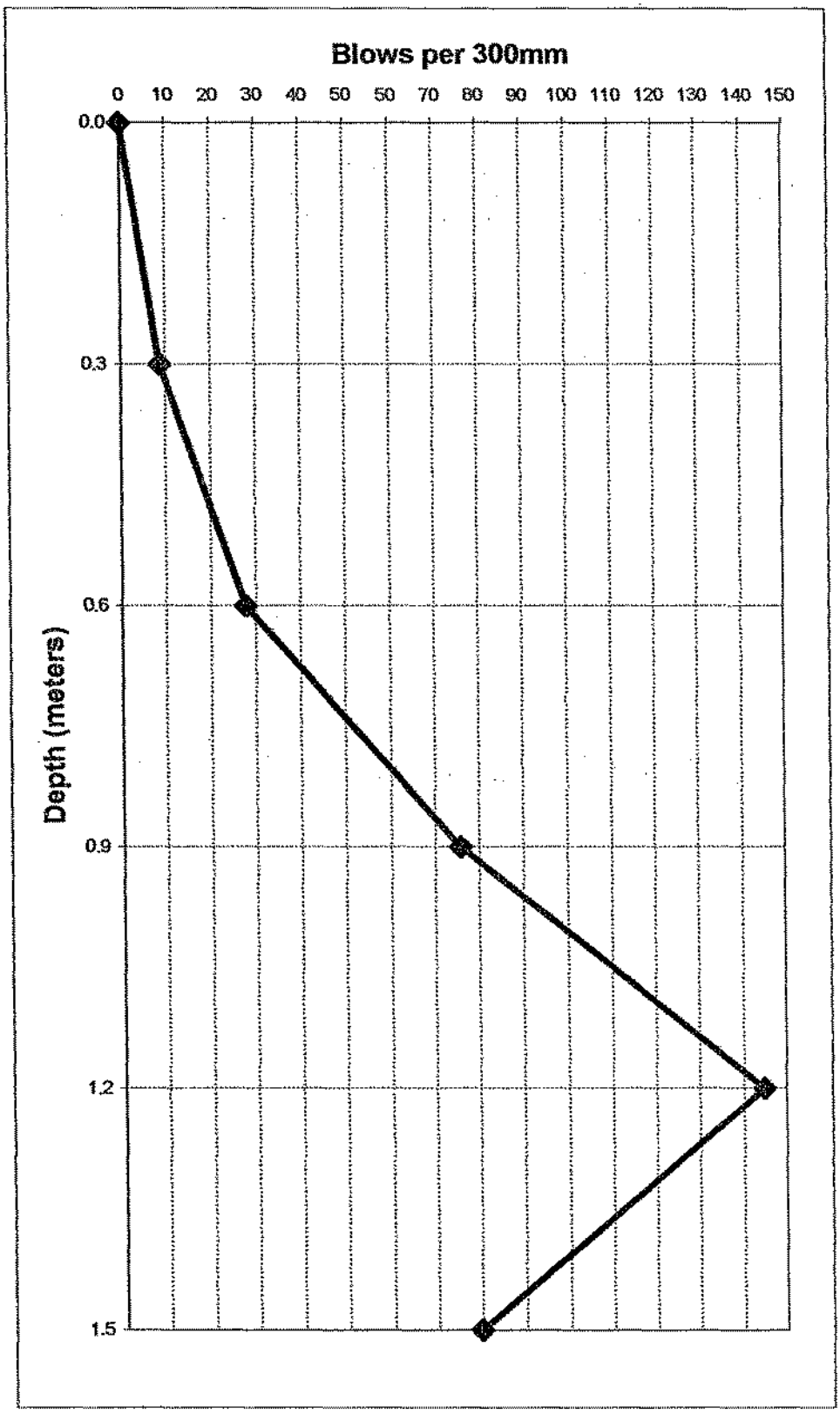
FIGURE C11



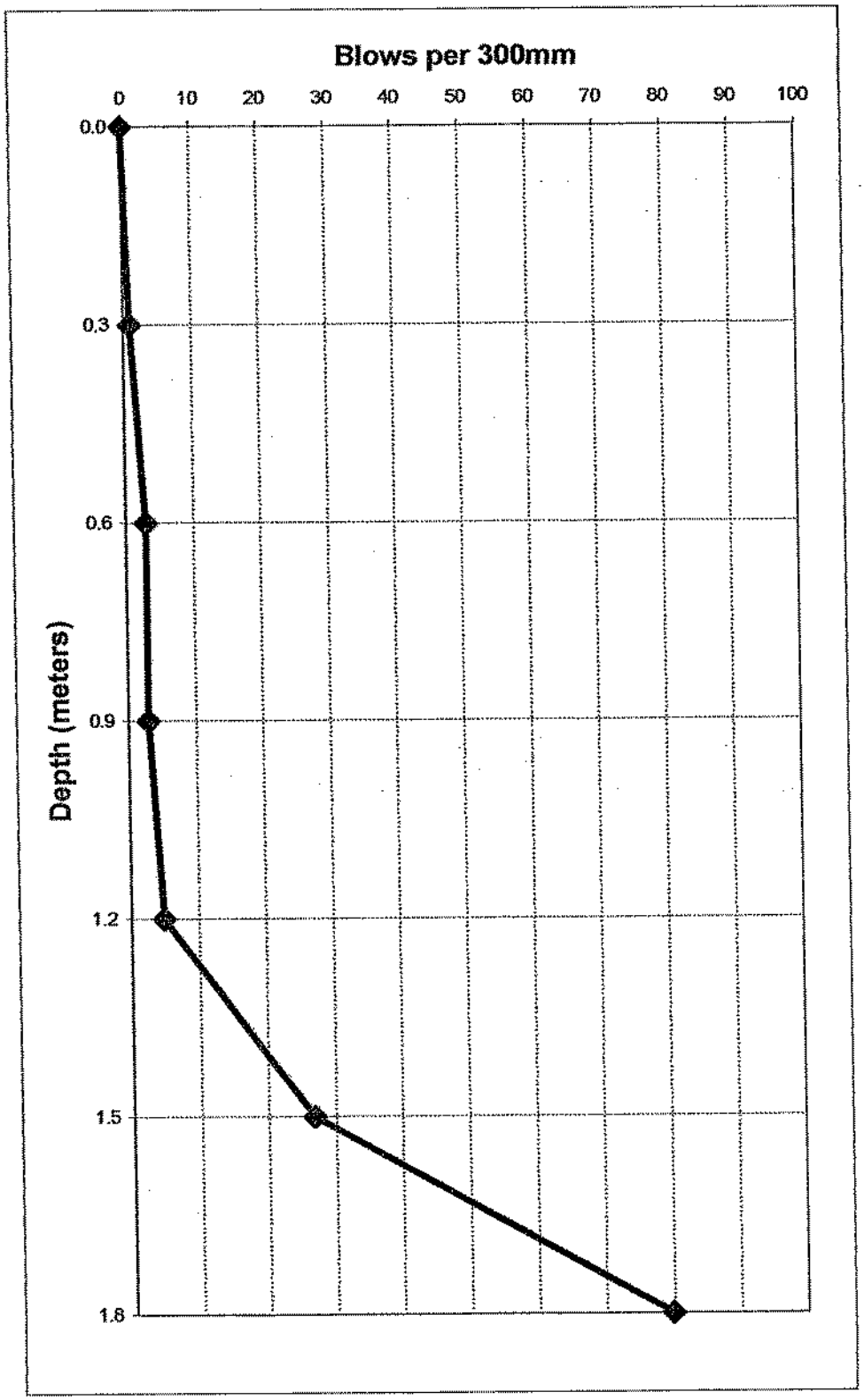
SOIL KRAFT

PENETRATION CURVE : DHSPT 12

FIGURE C12



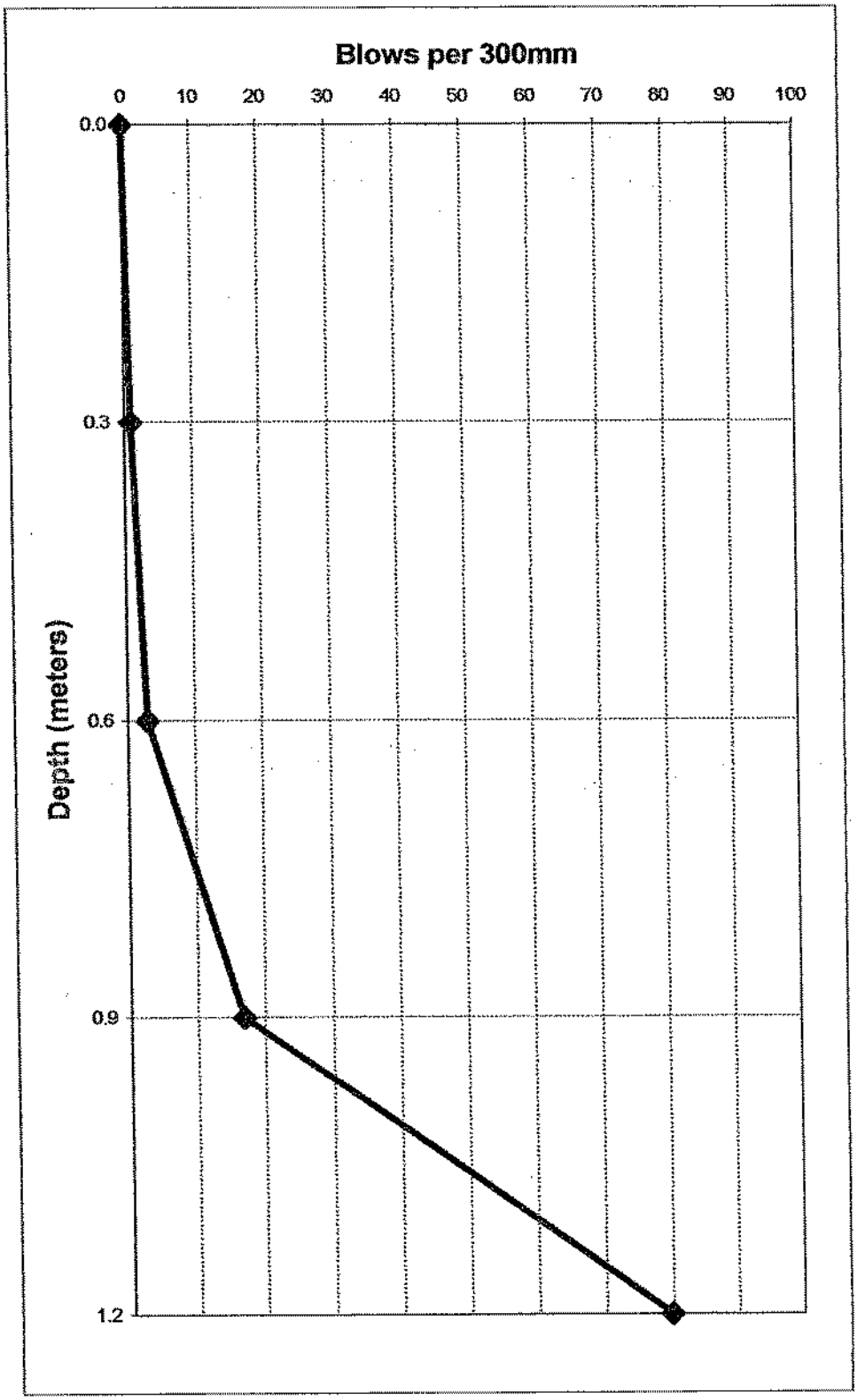
SOIL KRAFT	**PENETRATION CURVE : DHSPT 13**	**FIGURE C13**



SOIL KRAFT

PENETRATION CURVE : DHSPT 14

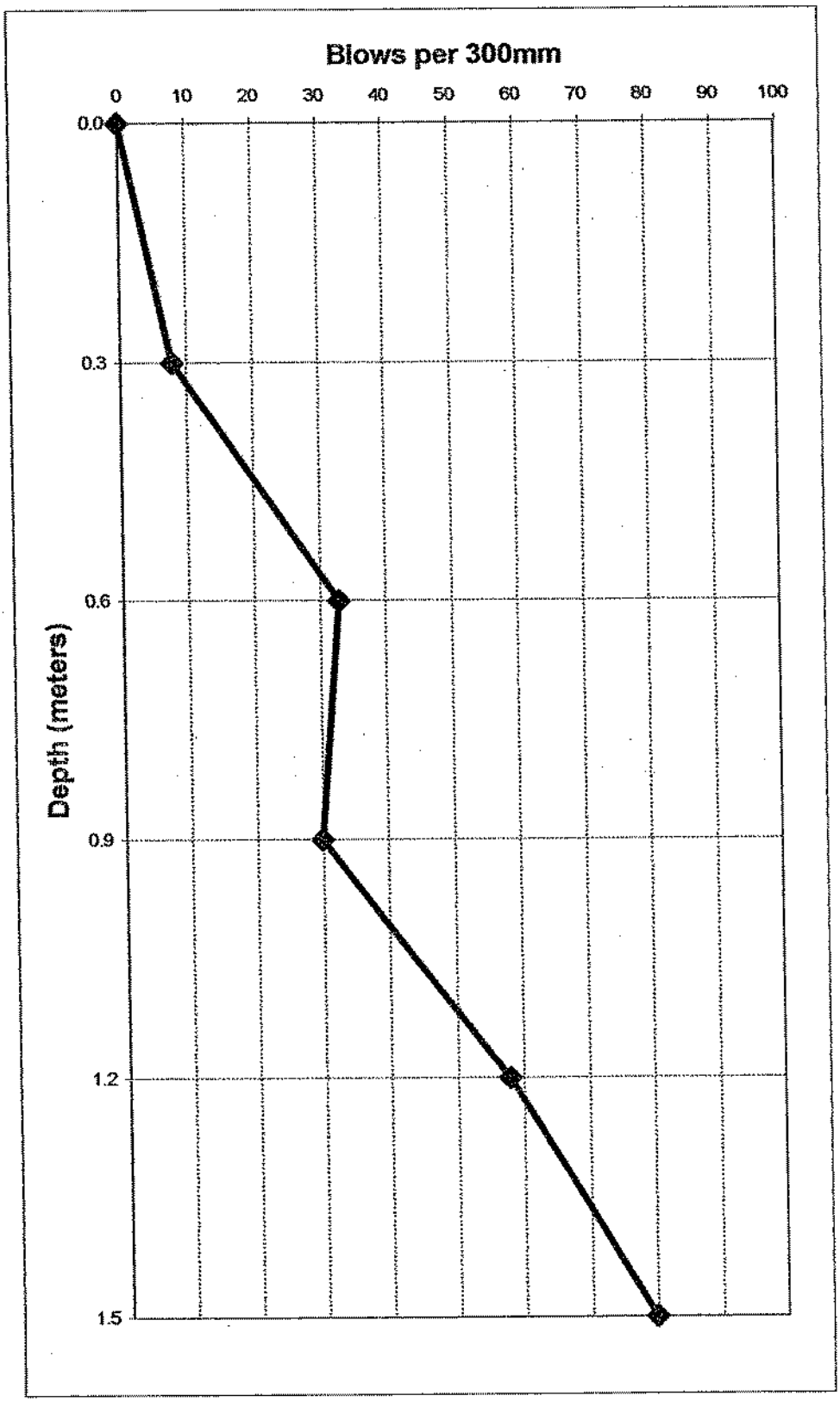
FIGURE C14



SOIL KRAFT

PENETRATION CURVE : DHSPT 15

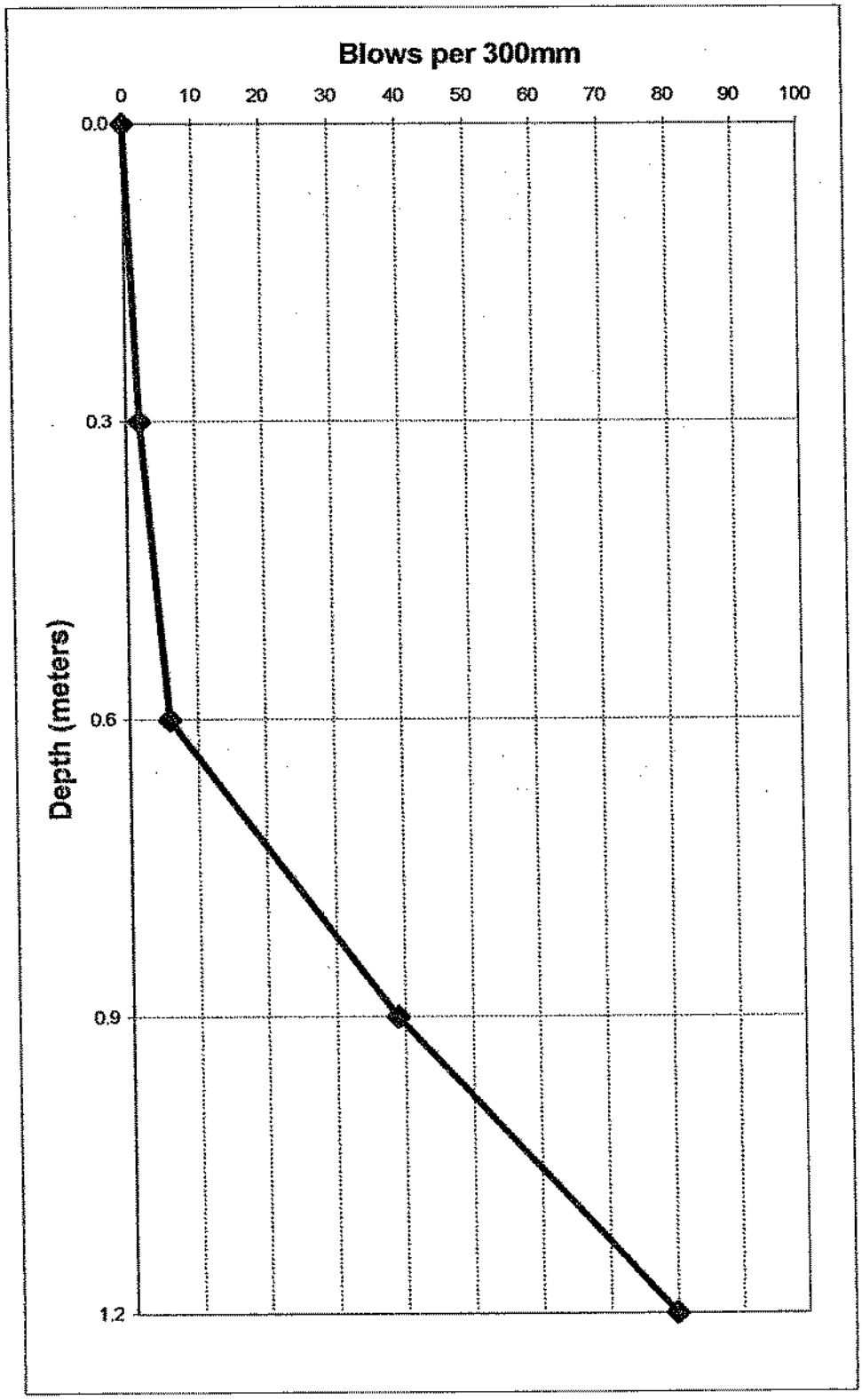
FIGURE C15



SOIL KRAFT

PENETRATION CURVE : DHSPT 16

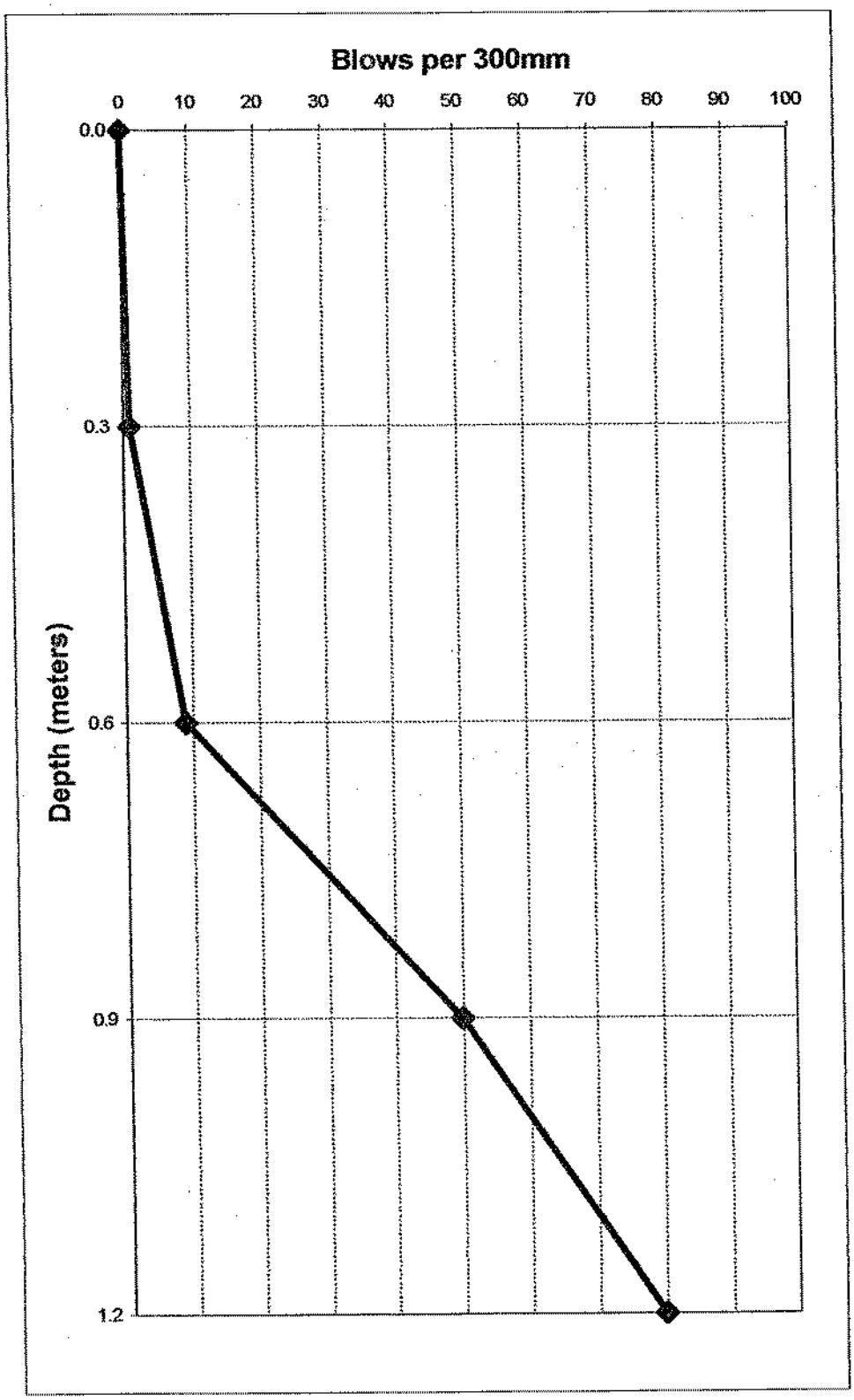
FIGURE C16



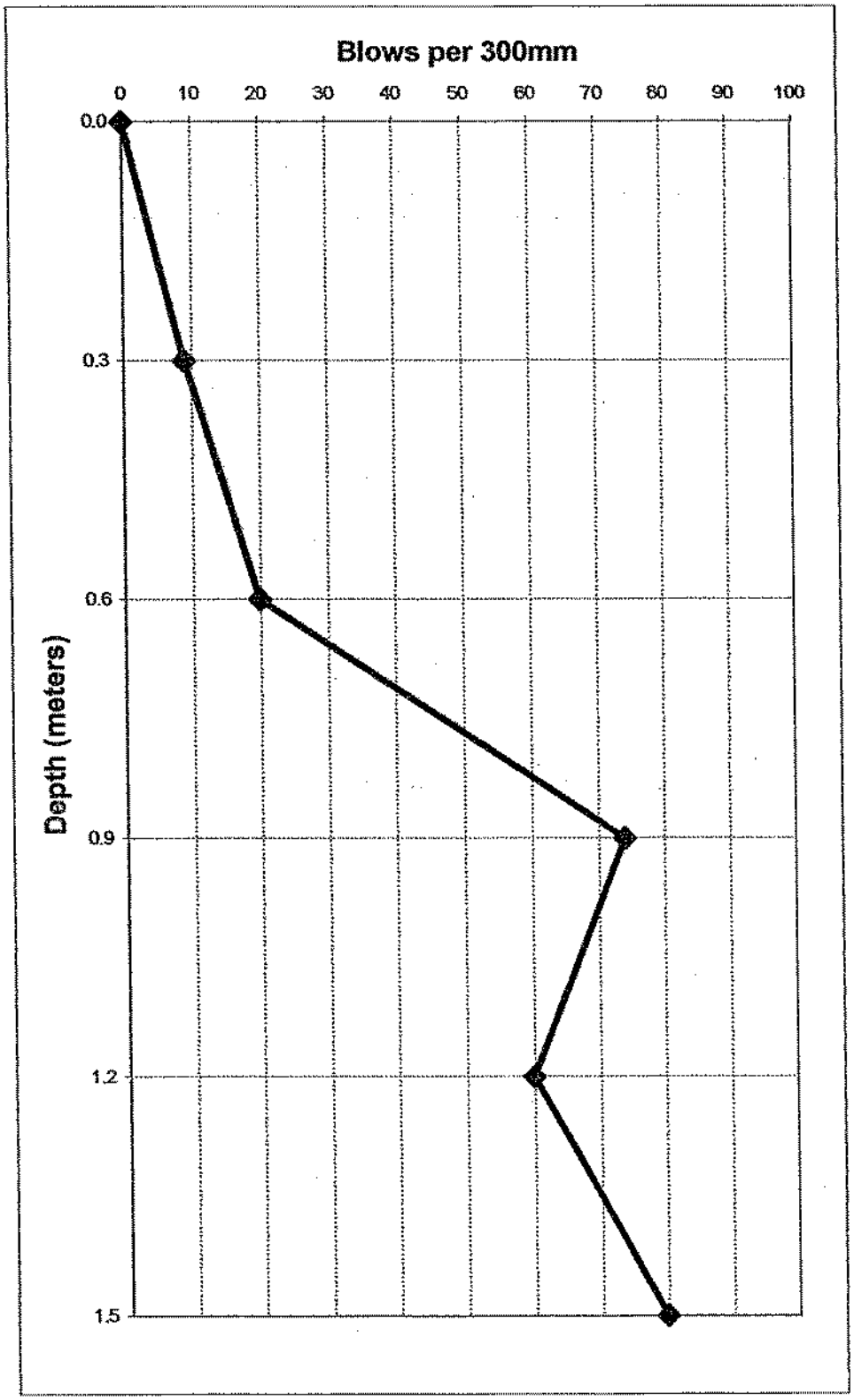
SOIL KRAFT

PENETRATION CURVE : DHSPT 17

FIGURE C17



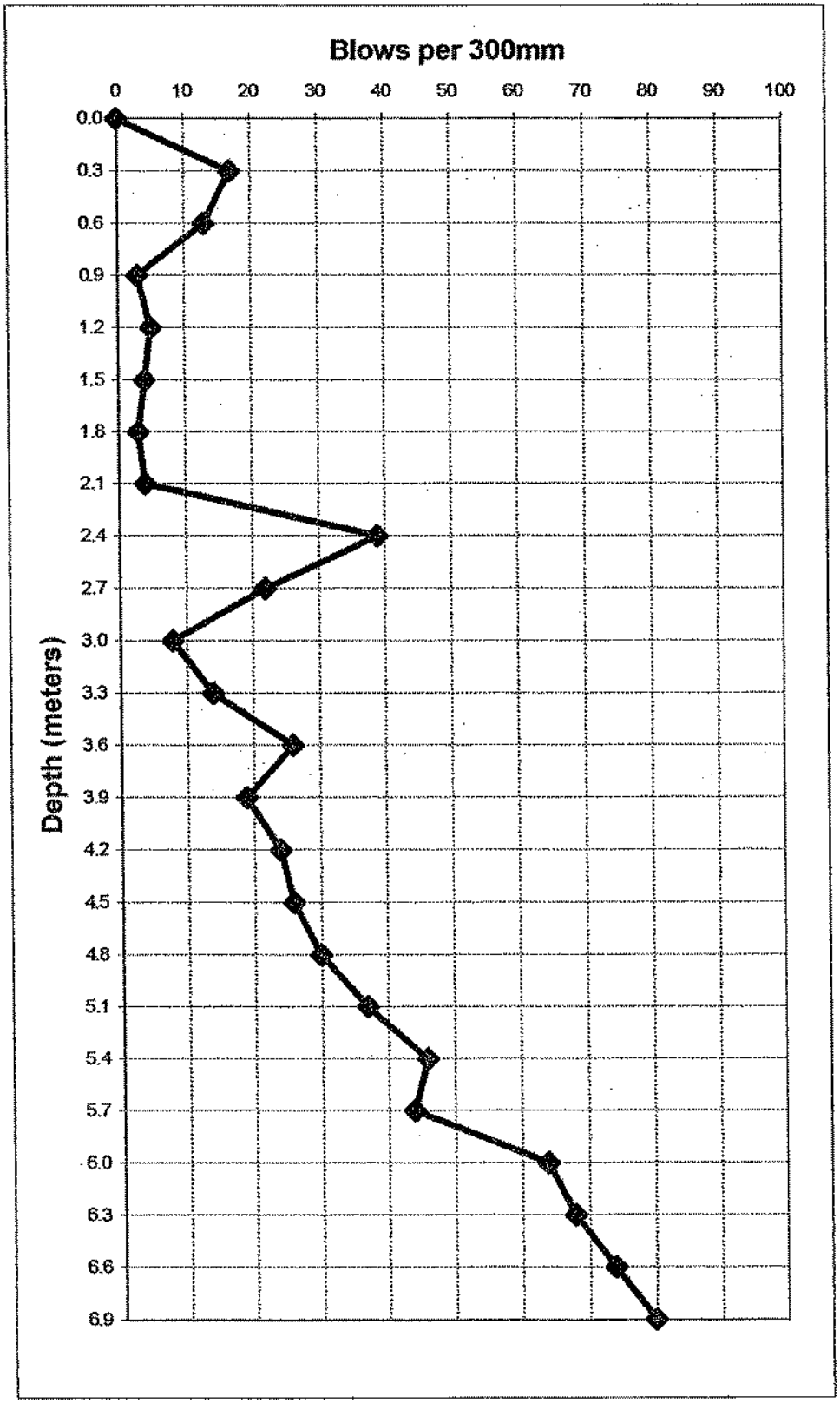
SOIL KRAFT	PENETRATION CURVE : DHSPT 18	FIGURE C18



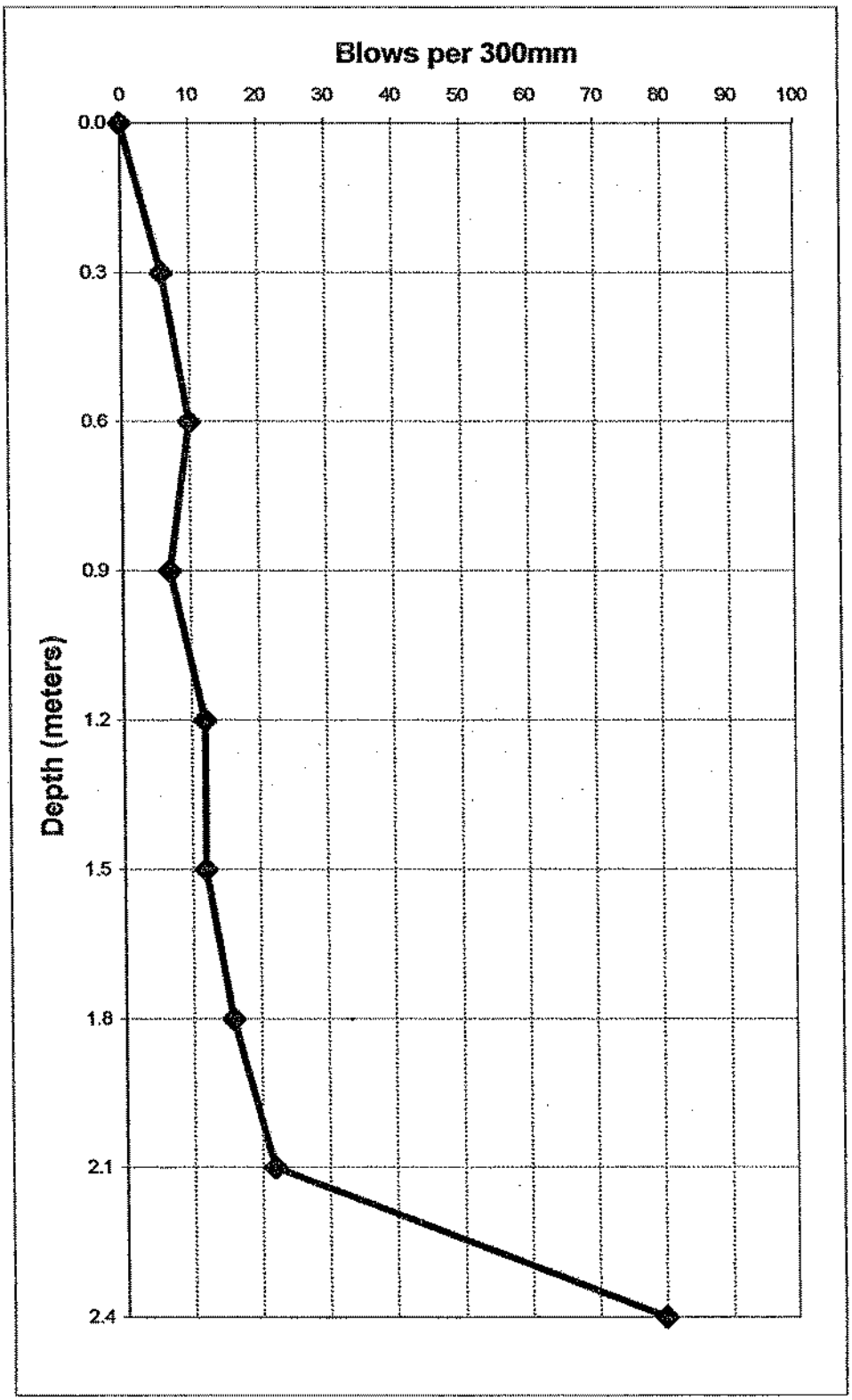
SOIL KRAFT

PENETRATION CURVE : DHSPT 19

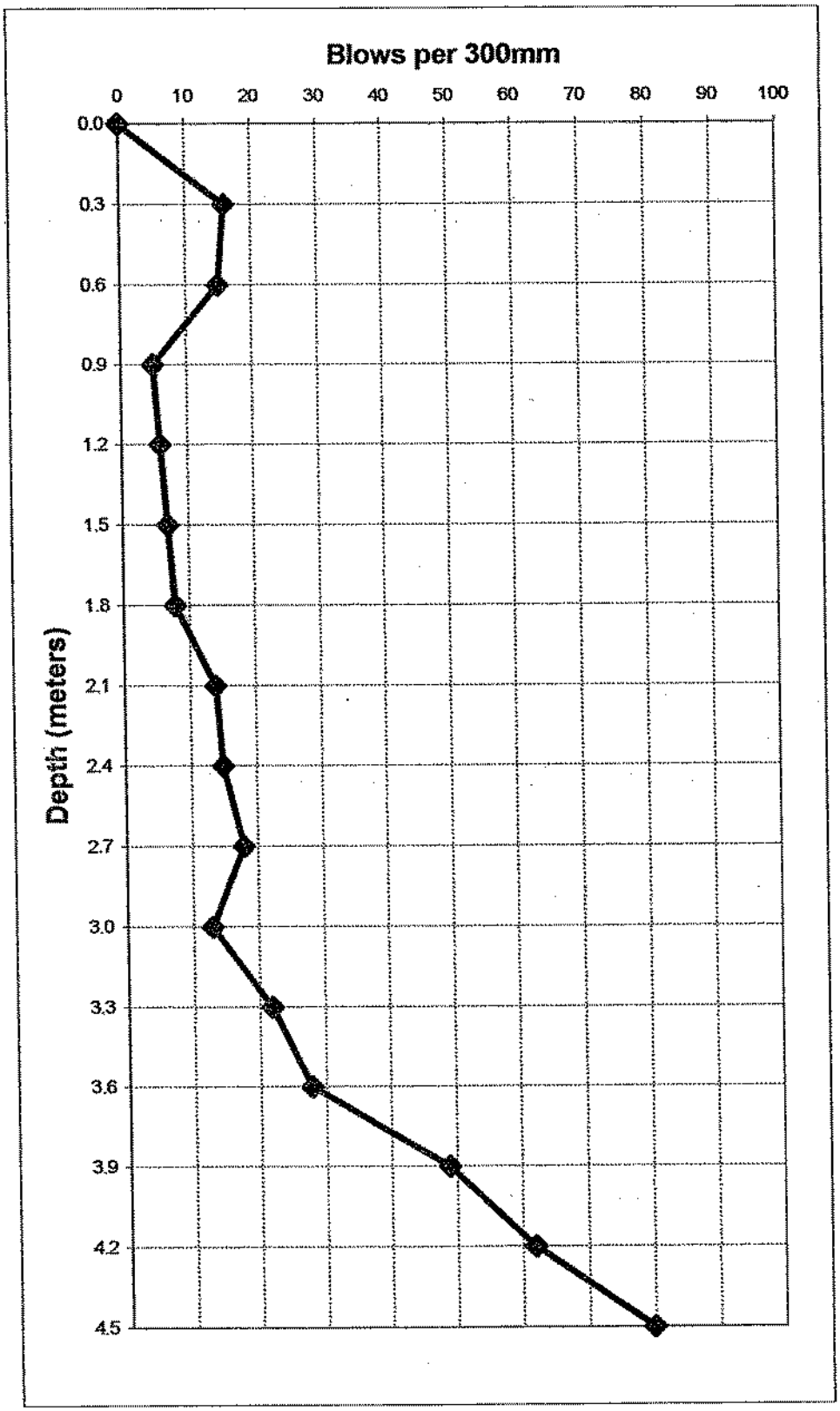
FIGURE C19



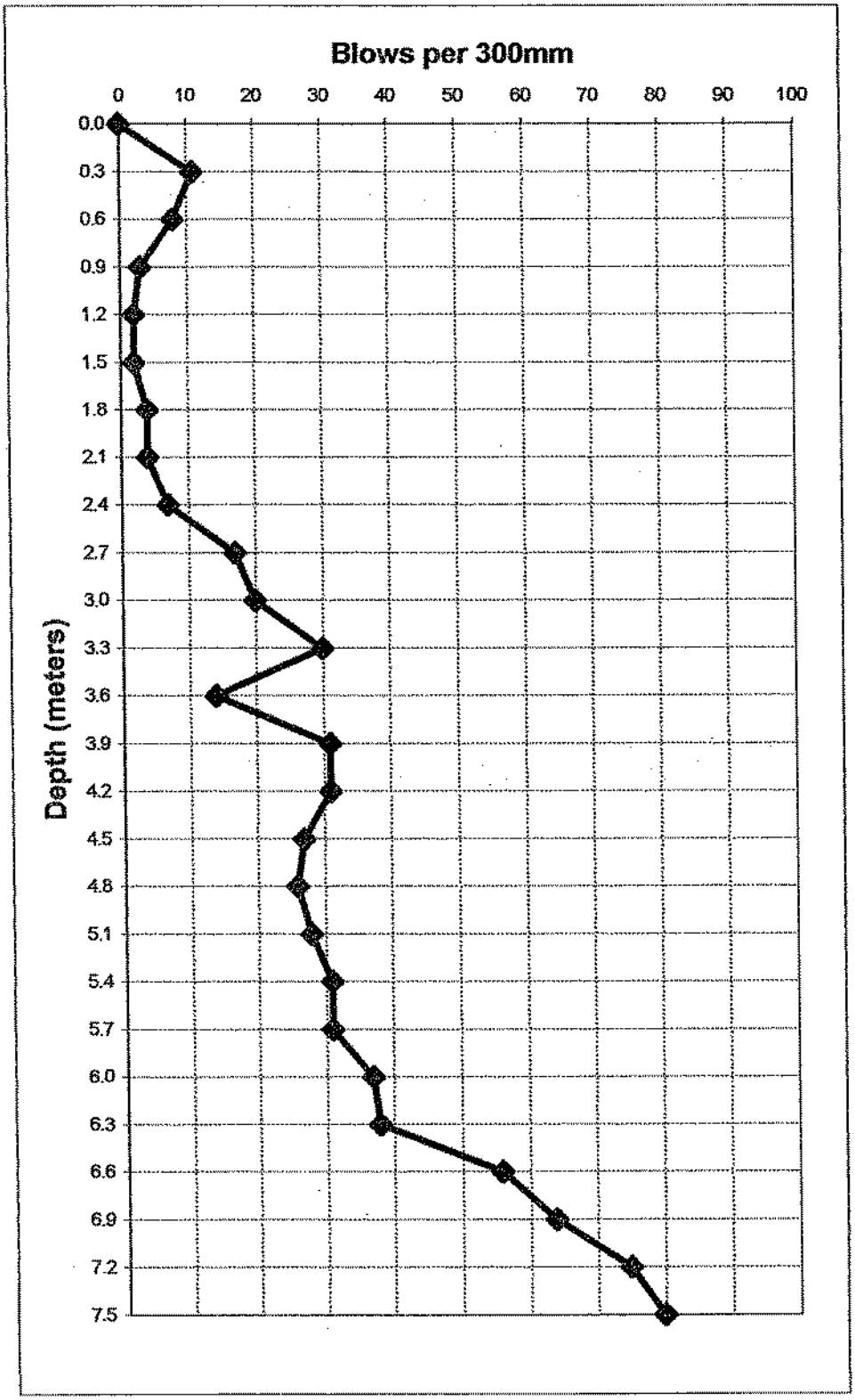
SOIL KRAFT	PENETRATION CURVE : DHSPT 20	FIGURE C20



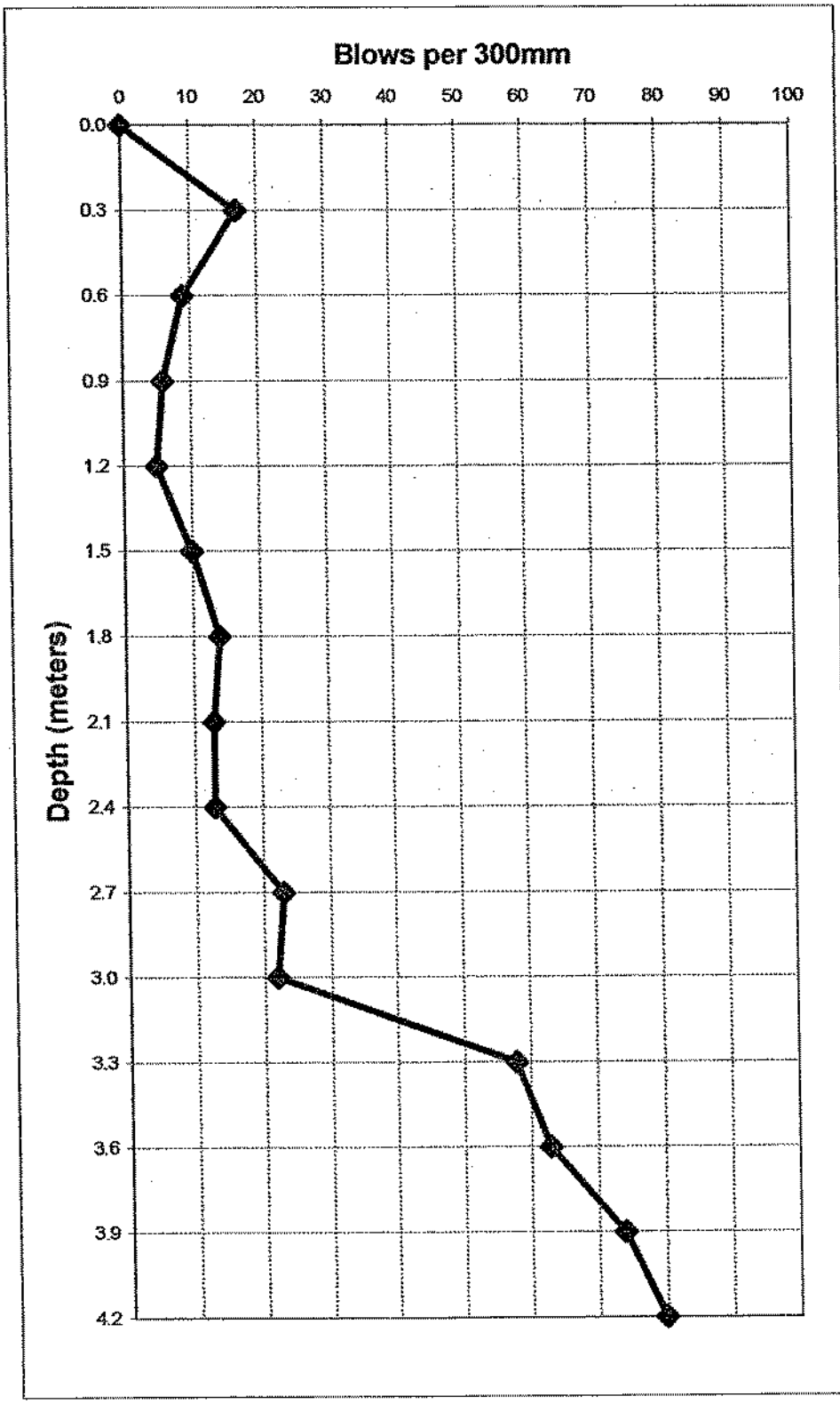
SOIL KRAFT	PENETRATION CURVE : DHSPT 21	FIGURE C21



SOIL KRAFT	PENETRATION CURVE : DHSPT 22	FIGURE C22



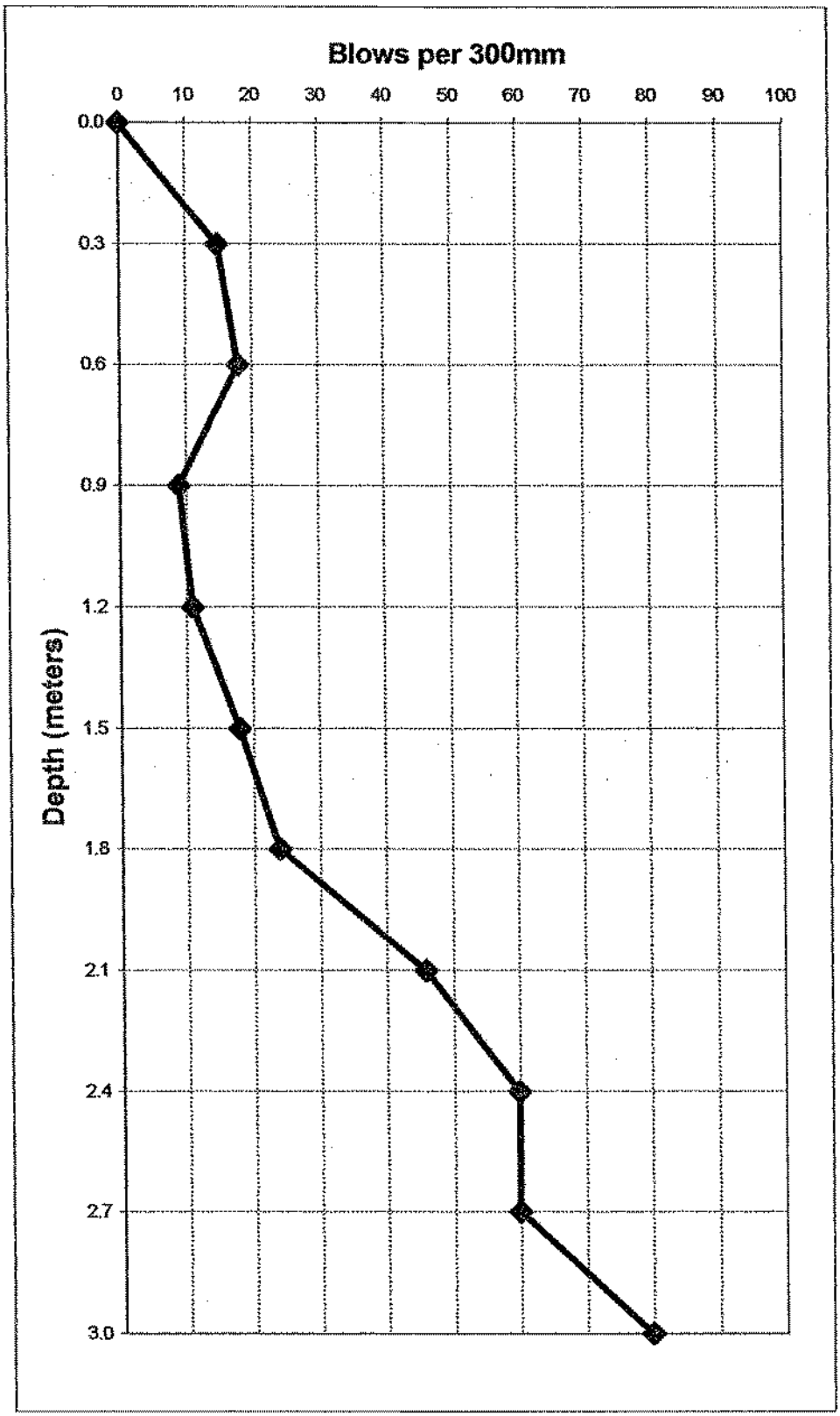
SOIL KRAFT	PENETRATION CURVE : DHSPT 23	FIGURE C23



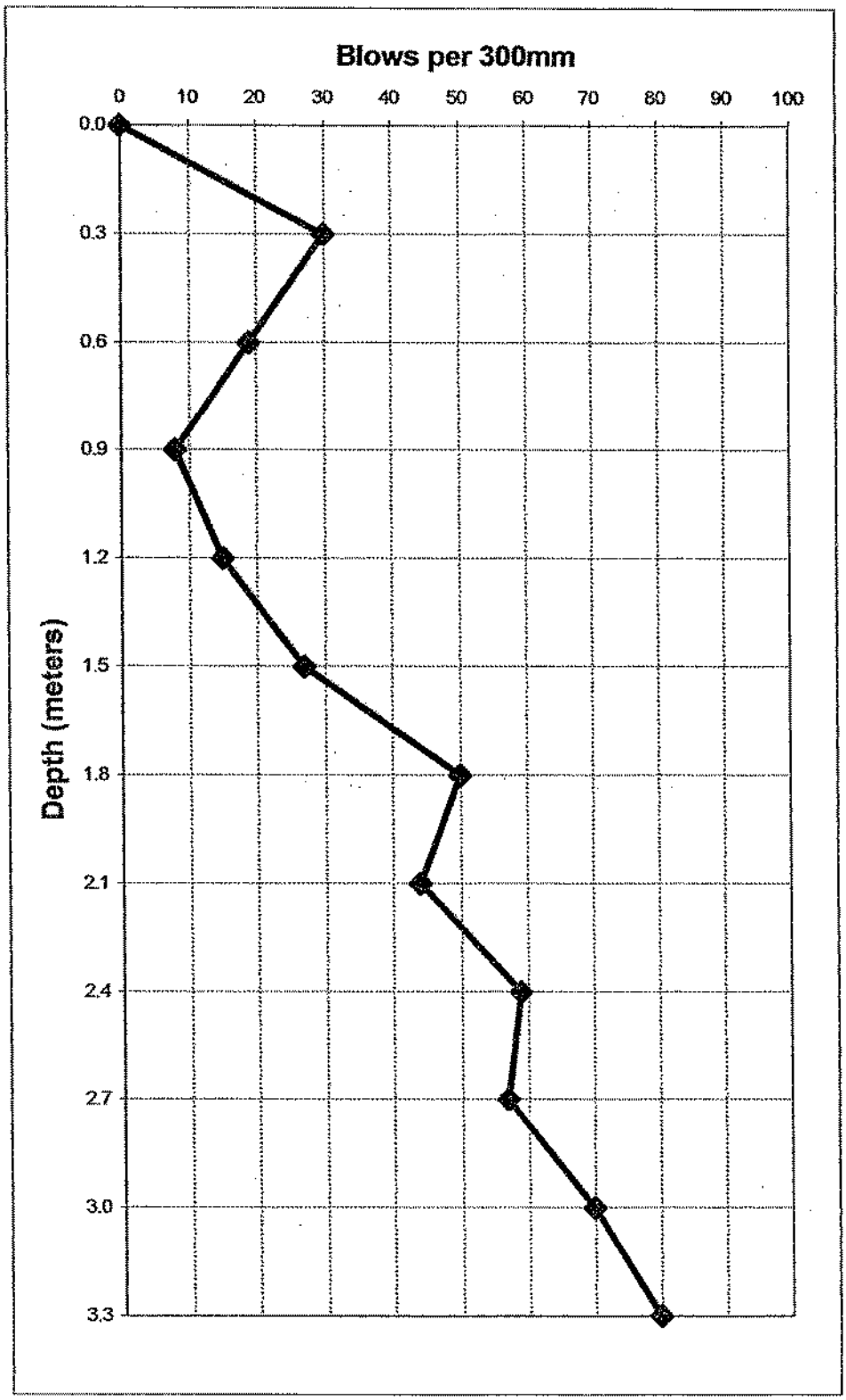
SOIL KRAFT

PENETRATION CURVE : DHSPT 24

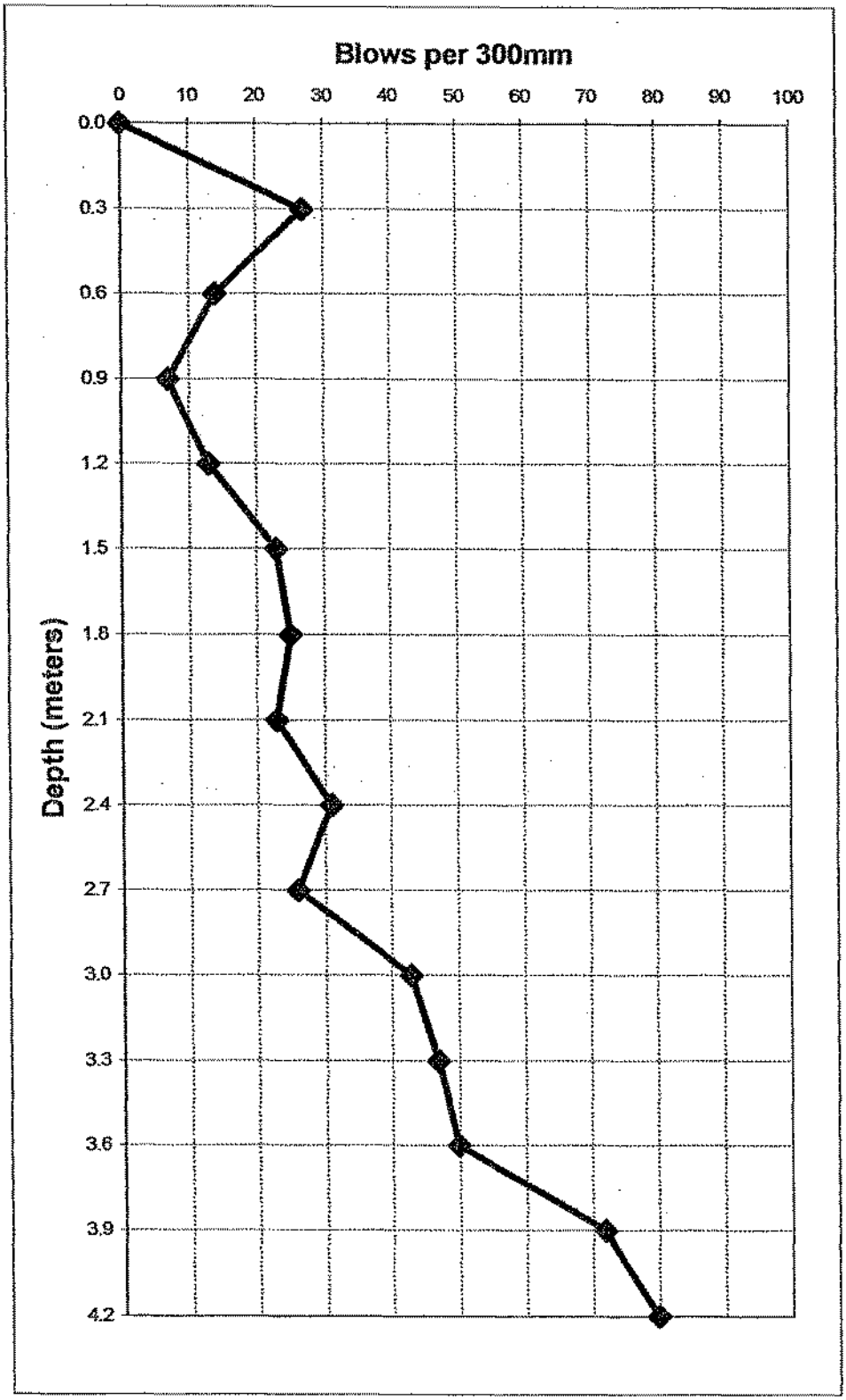
FIGURE C24



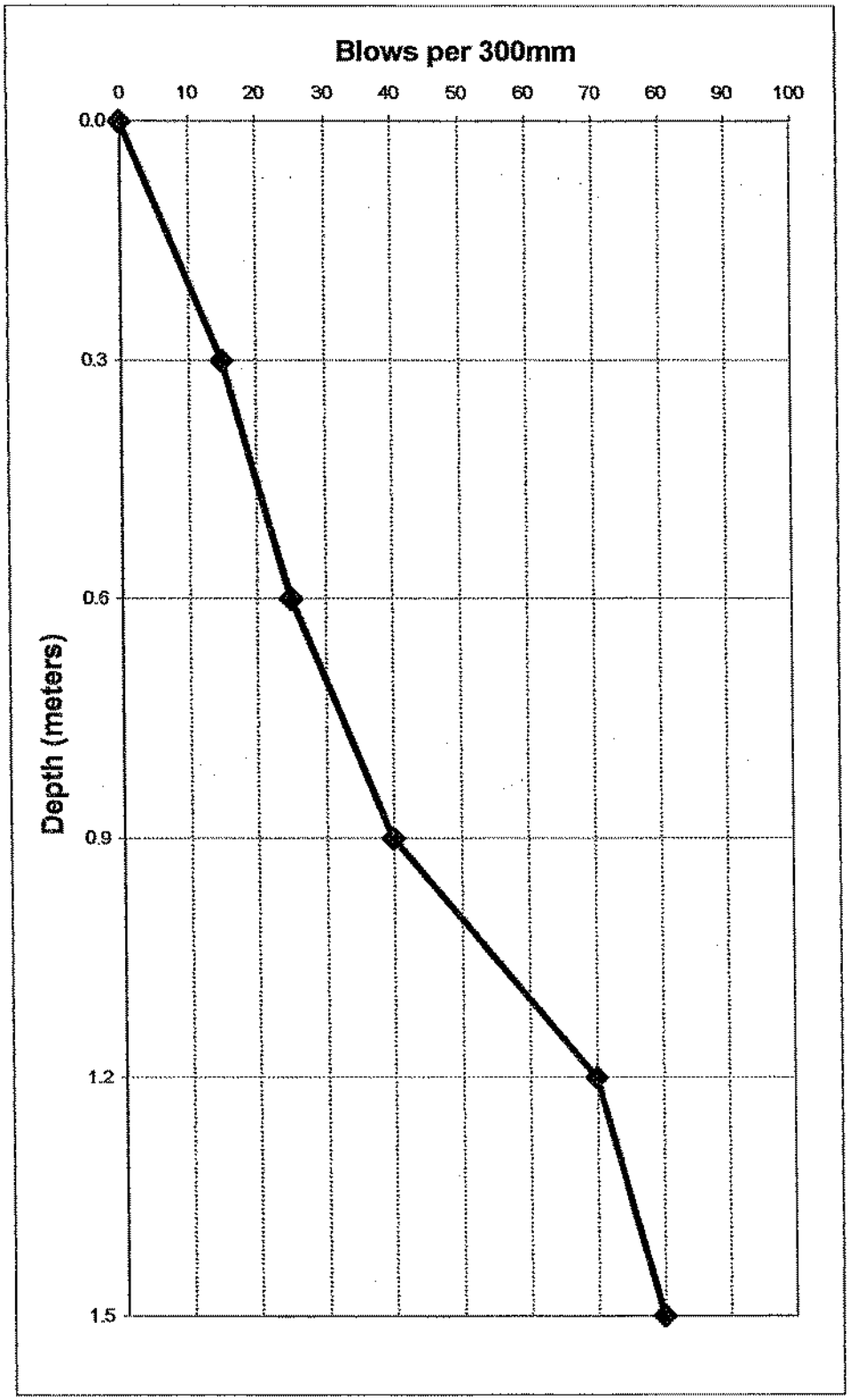
SOIL KRAFT	PENETRATION CURVE : DHSPT 25	FIGURE C25



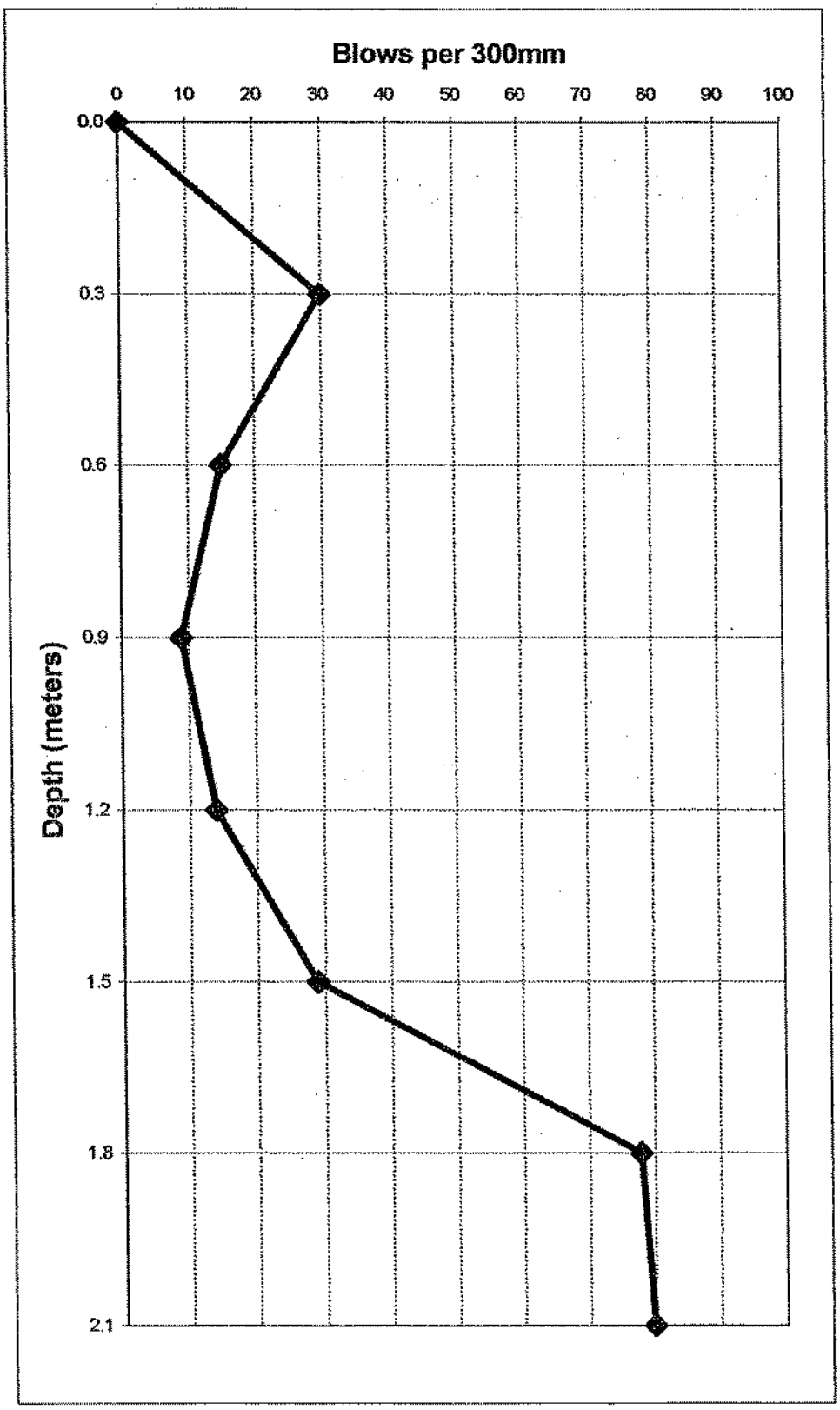
SOIL KRAFT	PENETRATION CURVE : DHSPT 26	FIGURE C26



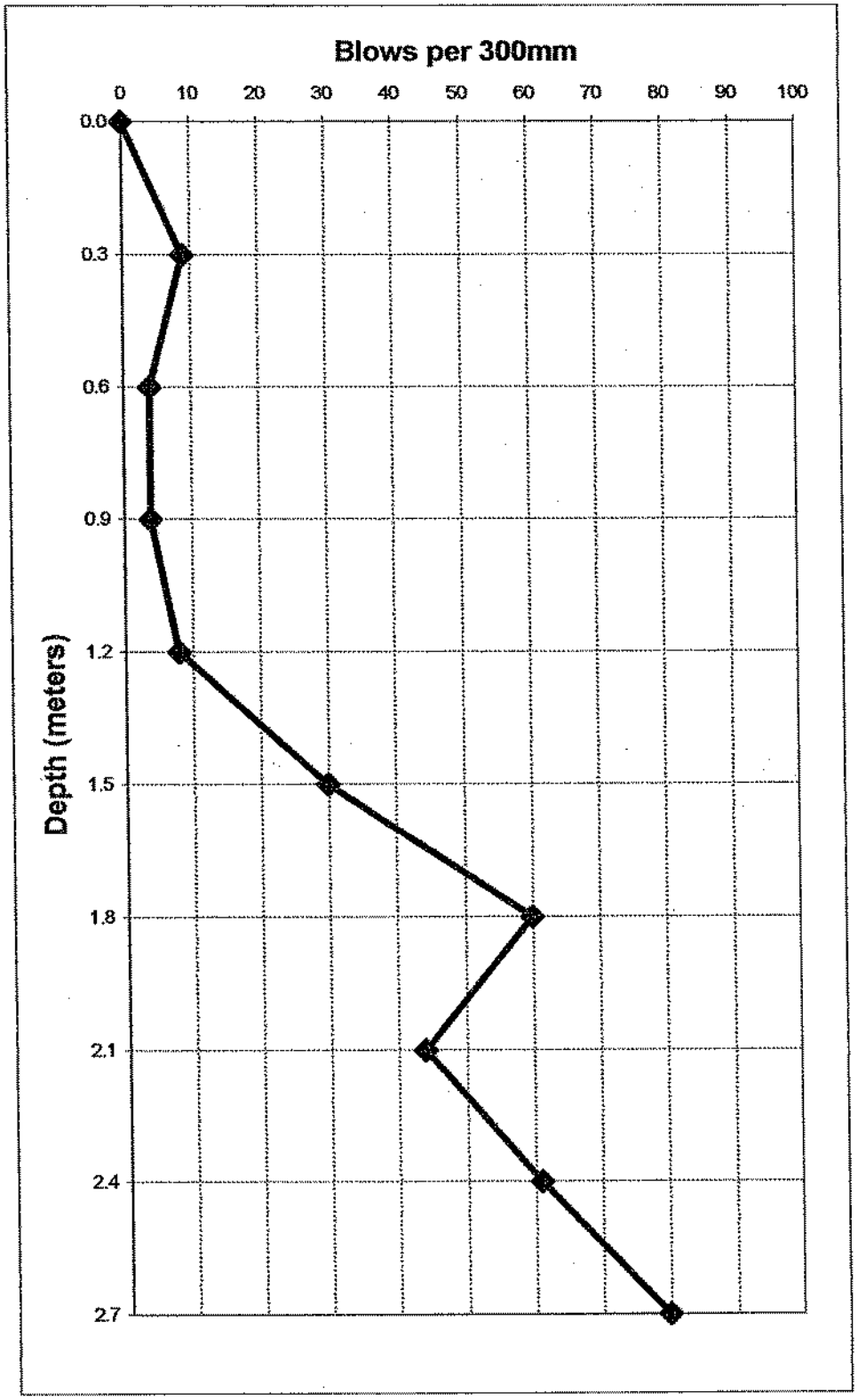
SOIL KRAFT	PENETRATION CURVE : DHSPT 27	FIGURE C27



SOIL KRAFT	**PENETRATION CURVE : DHSPT 28**	**FIGURE C28**



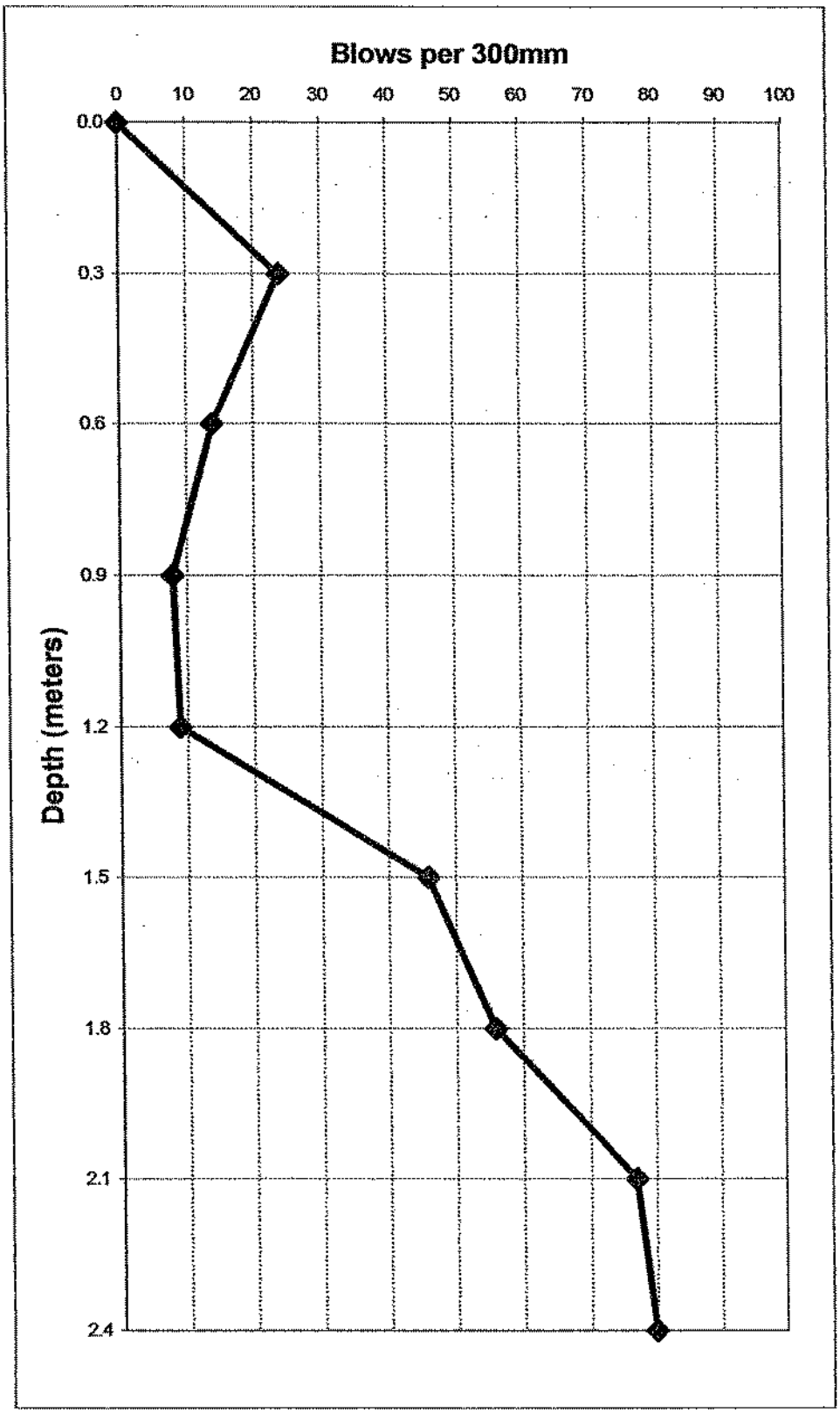
SOIL KRAFT	PENETRATION CURVE : DHSPT 29	FIGURE C29



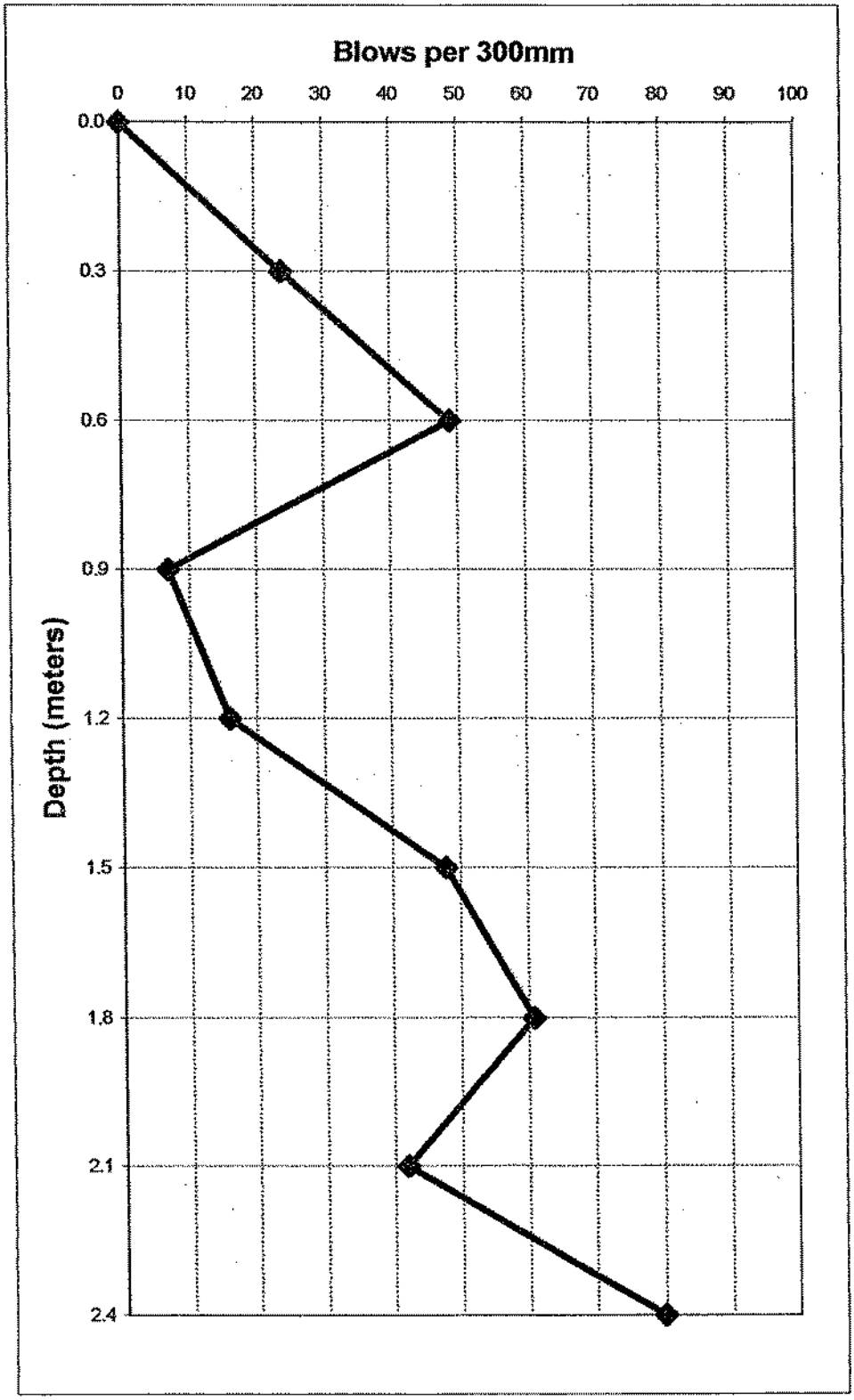
SOIL KRAFT

PENETRATION CURVE : DHSPT 30

FIGURE C30



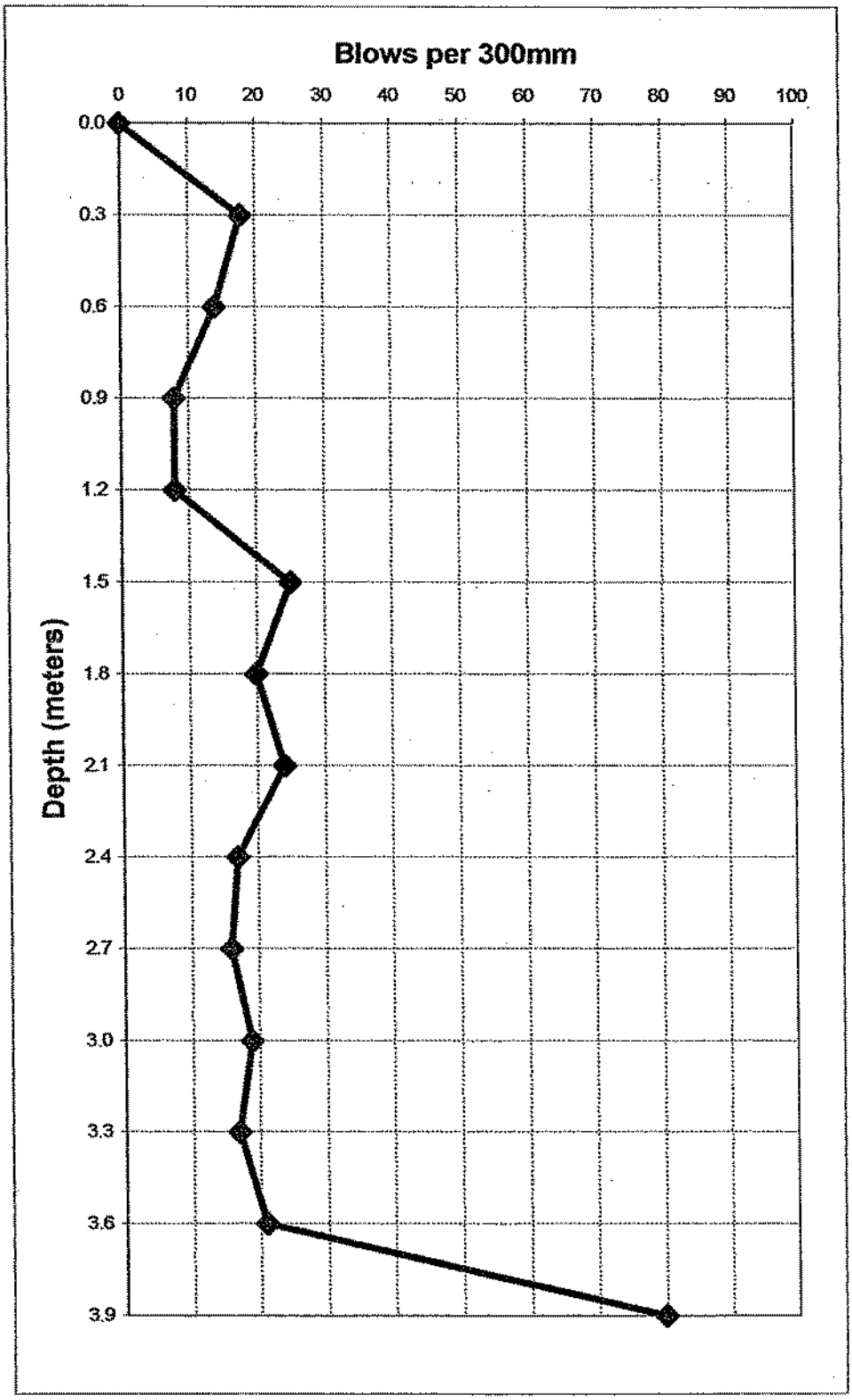
SOIL KRAFT	PENETRATION CURVE : DHSPT 31	FIGURE C31



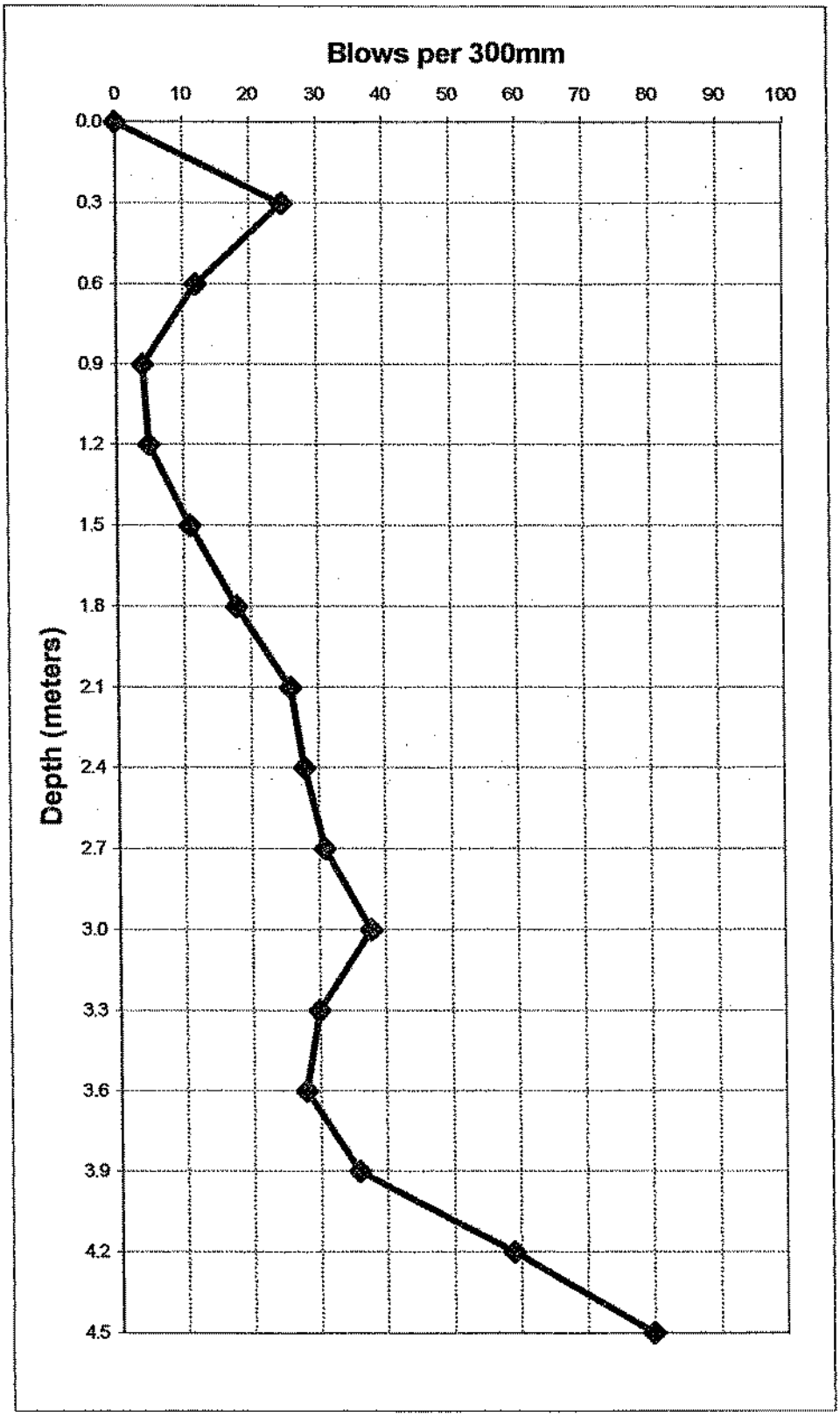
SOIL KRAFT

PENETRATION CURVE : DHSPT 32

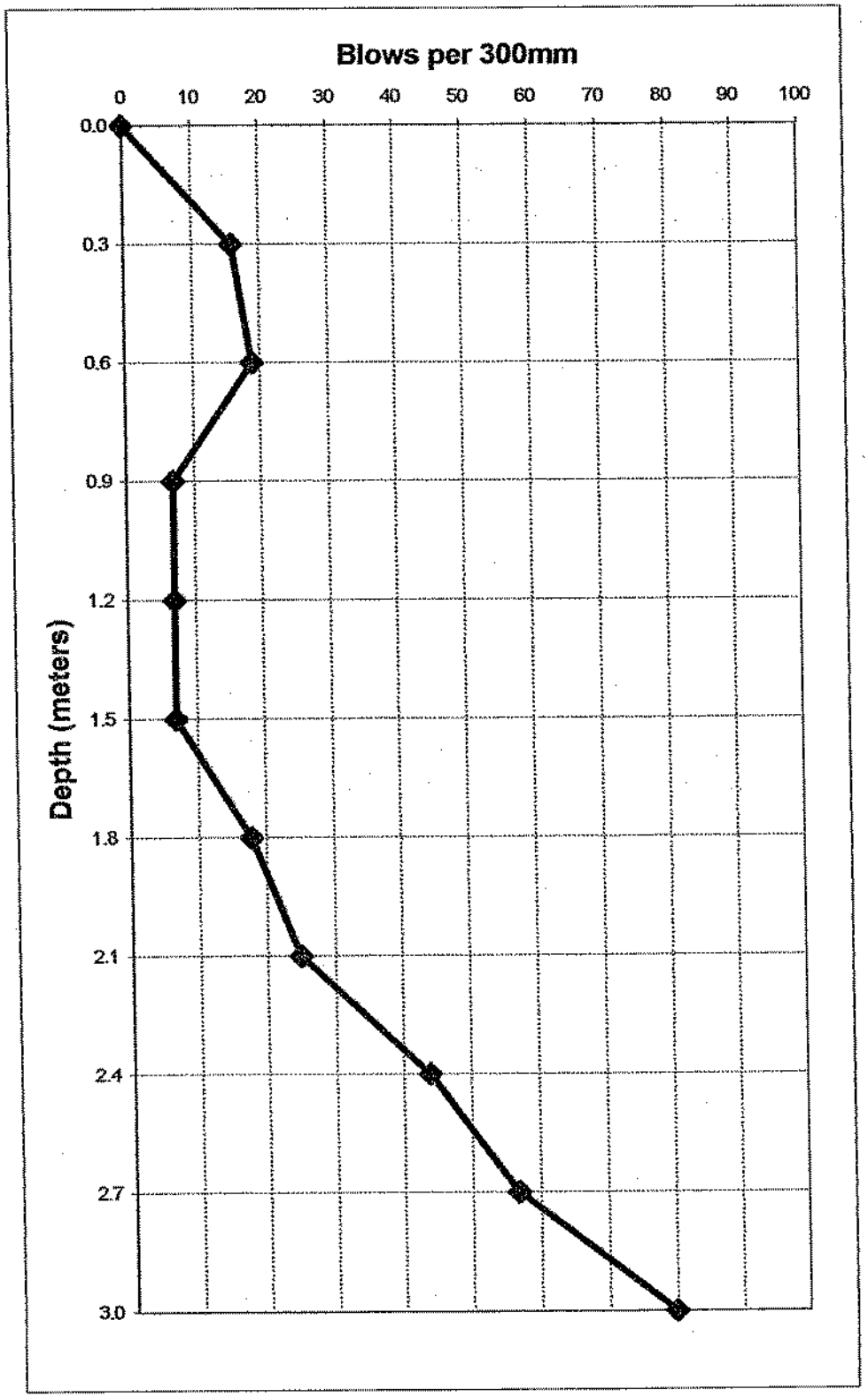
FIGURE C32



SOIL KRAFT	PENETRATION CURVE : DHSPT 33	FIGURE C33



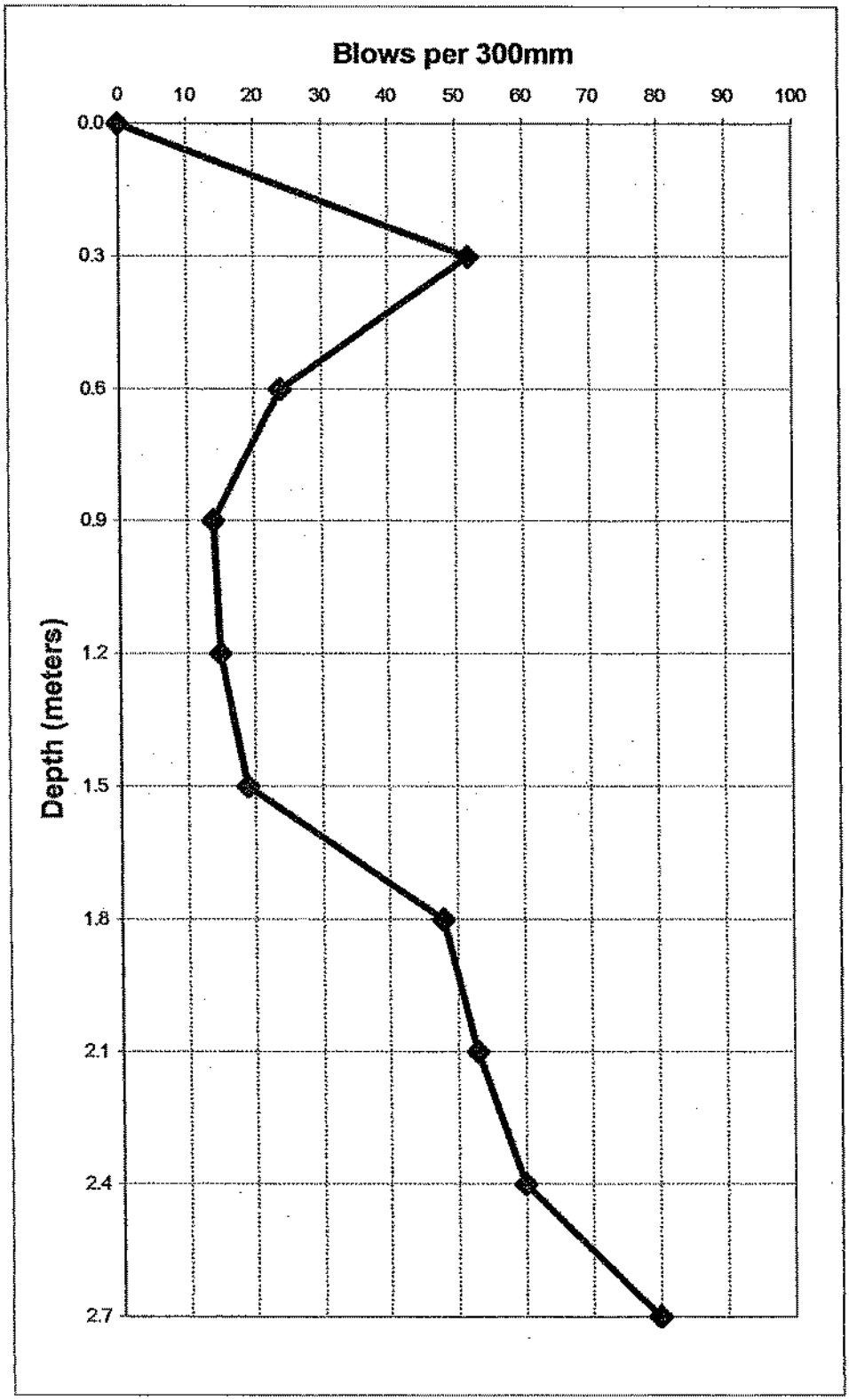
SOIL KRAFT	PENETRATION CURVE : DHSPT 34	FIGURE C34



SOIL KRAFT

PENETRATION CURVE : DHSPT 35

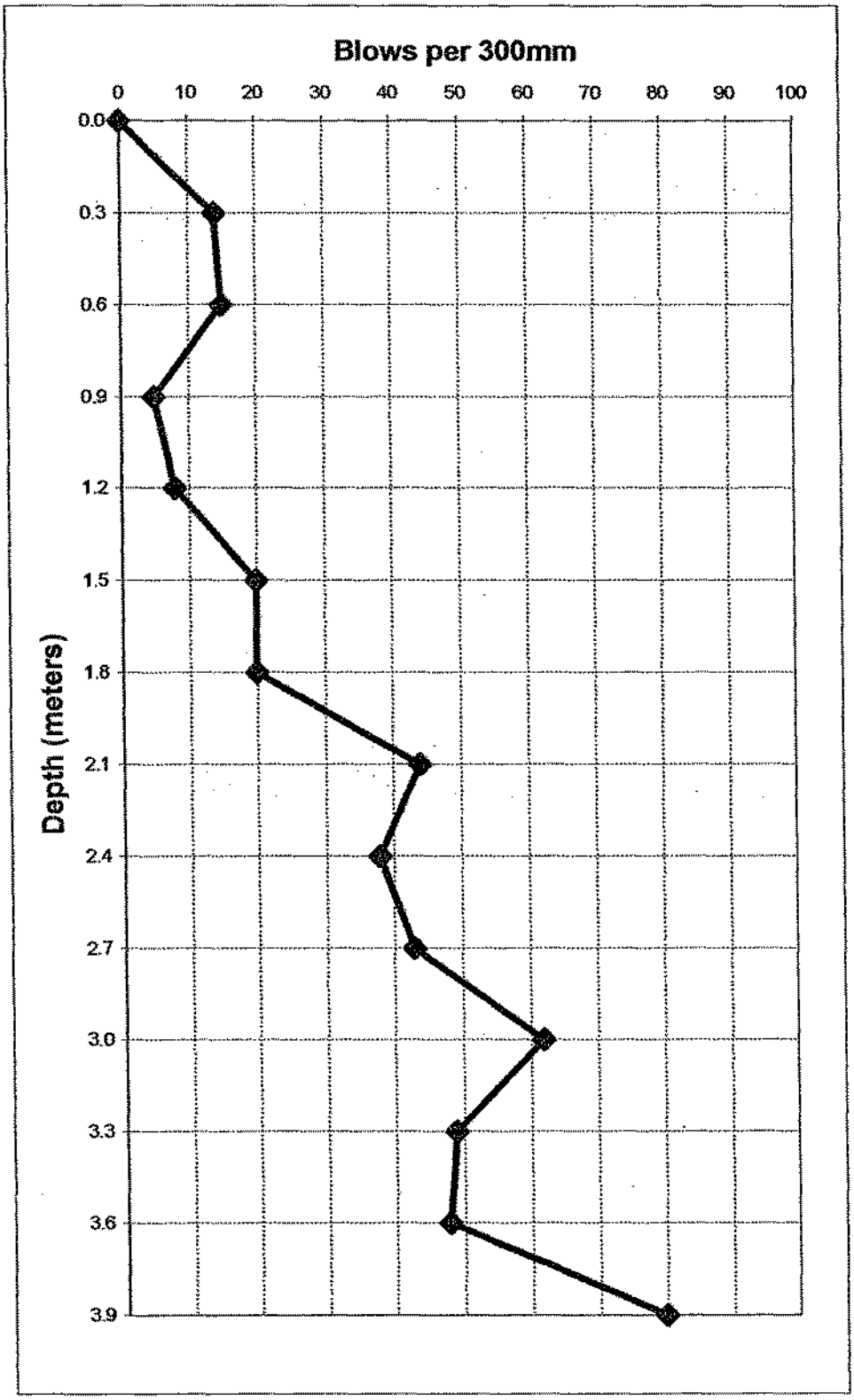
FIGURE C35



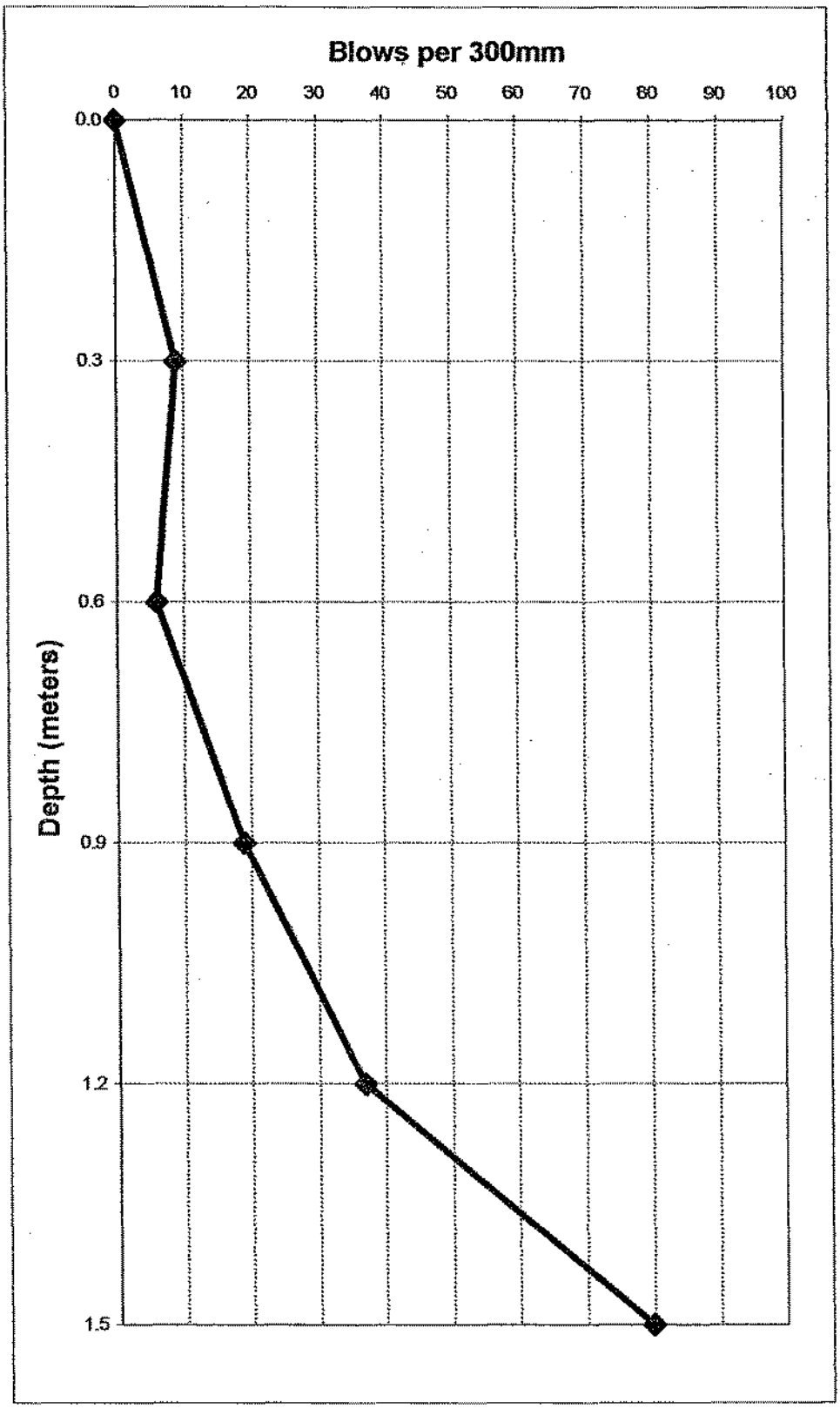
SOIL KRAFT

PENETRATION CURVE : DHSPT 36

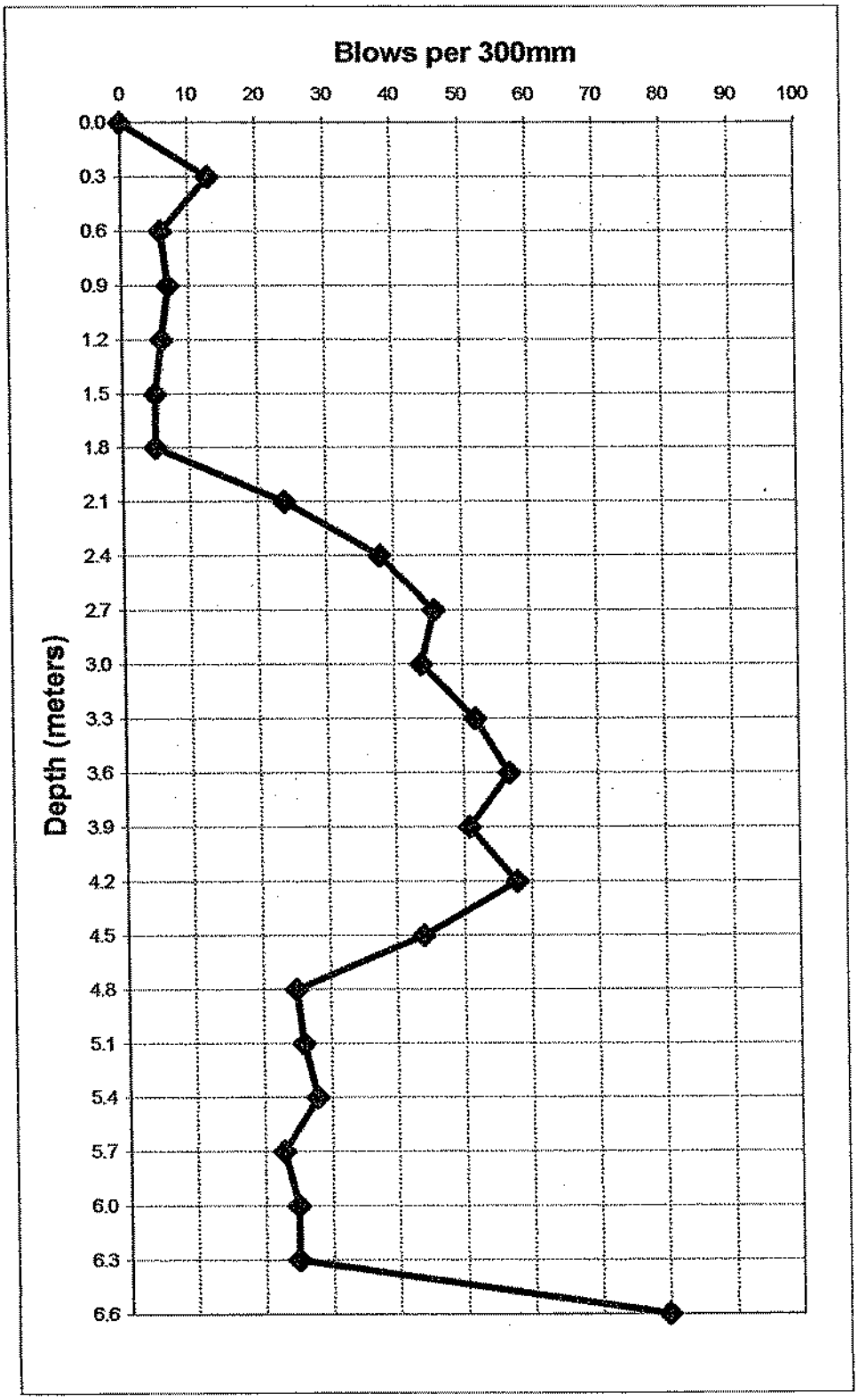
FIGURE C36



SOIL KRAFT	PENETRATION CURVE : DHSPT 37	FIGURE C37



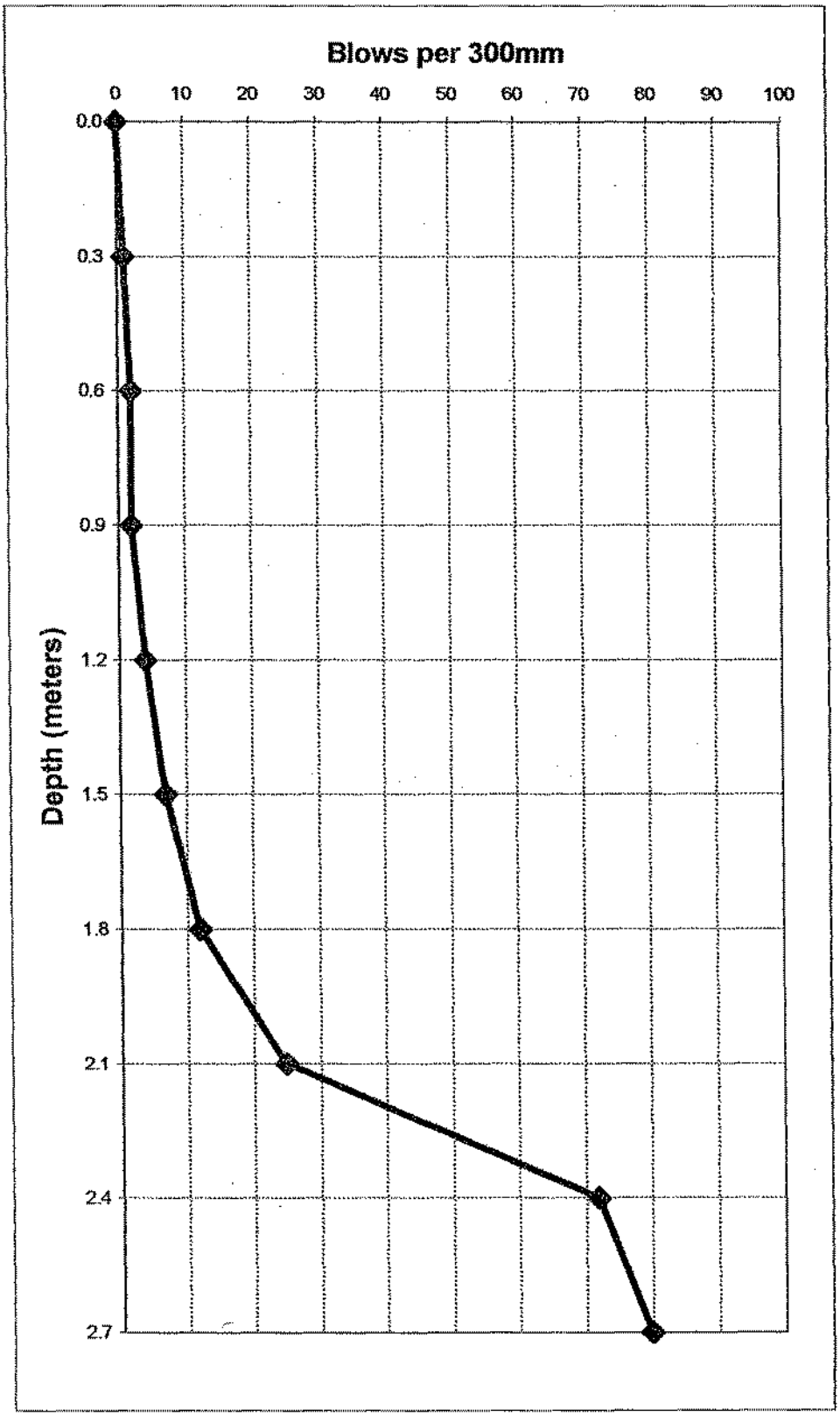
SOIL KRAFT	**PENETRATION CURVE : DHSPT 38**	**FIGURE C38**



SOIL KRAFT

PENETRATION CURVE : DHSPT 39

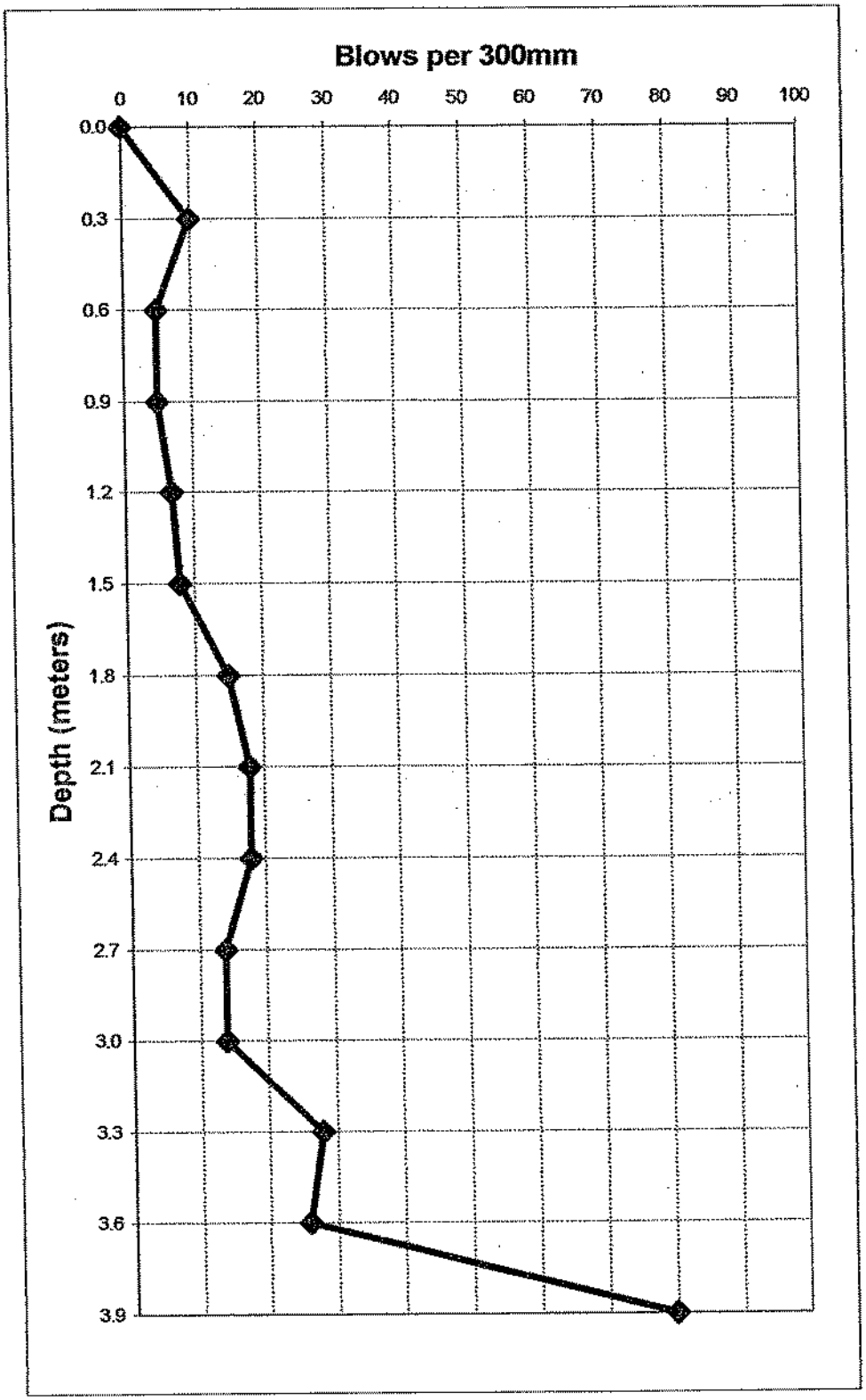
FIGURE C39



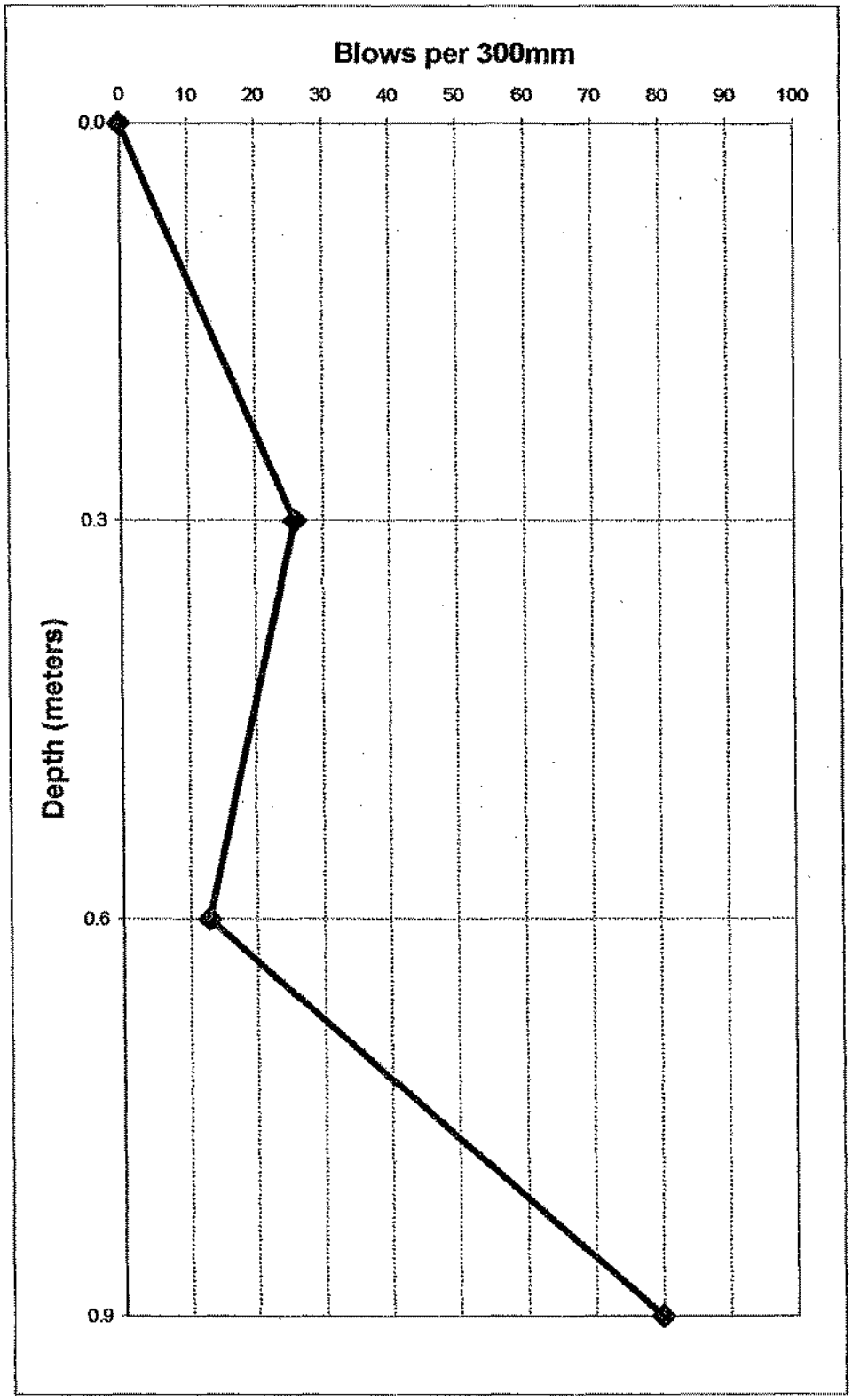
SOIL KRAFT

PENETRATION CURVE : DHSPT 40

FIGURE C40



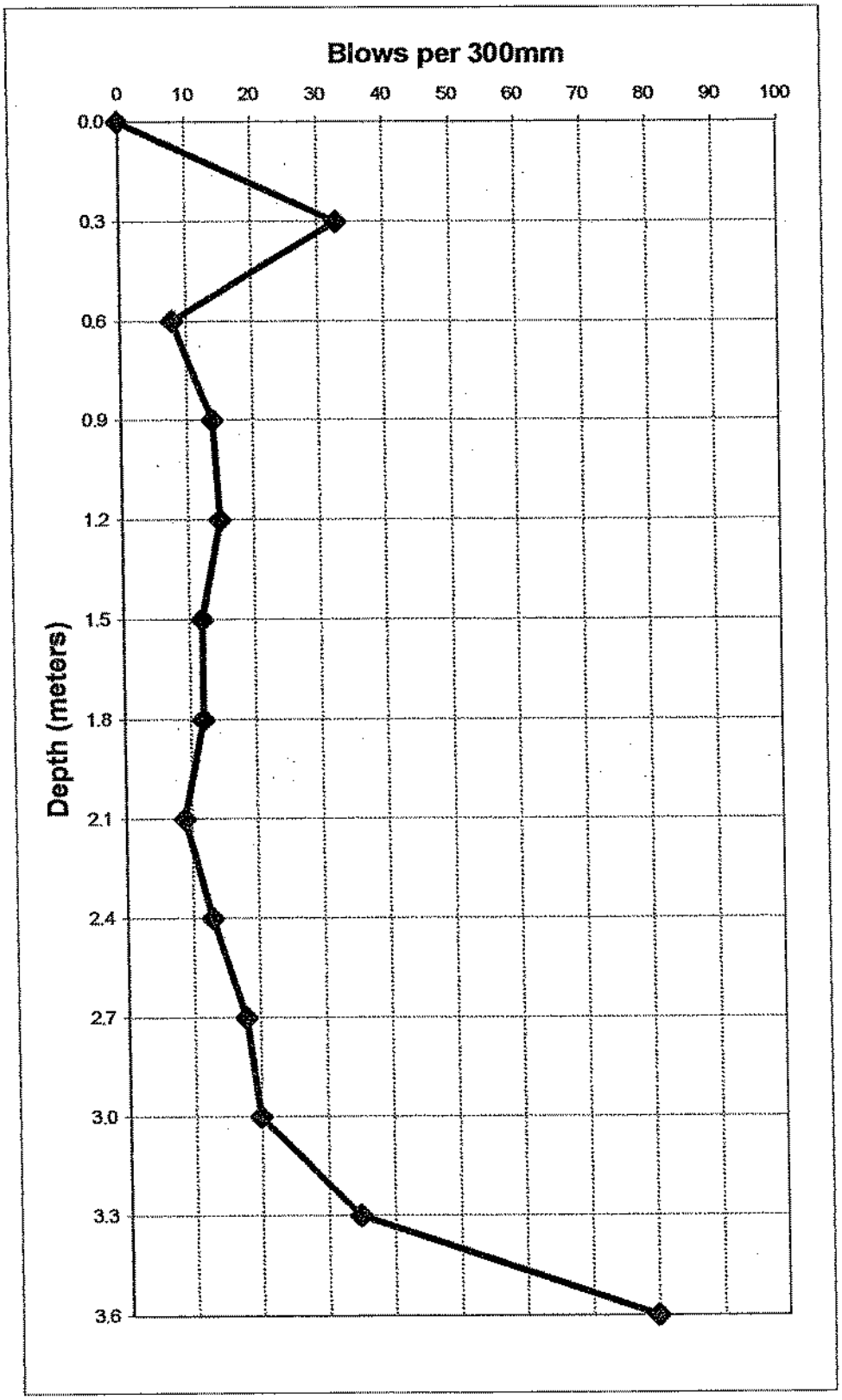
SOIL KRAFT	PENETRATION CURVE : DHSPT 41	FIGURE C41



SOIL KRAFT

PENETRATION CURVE : DHSPT 42

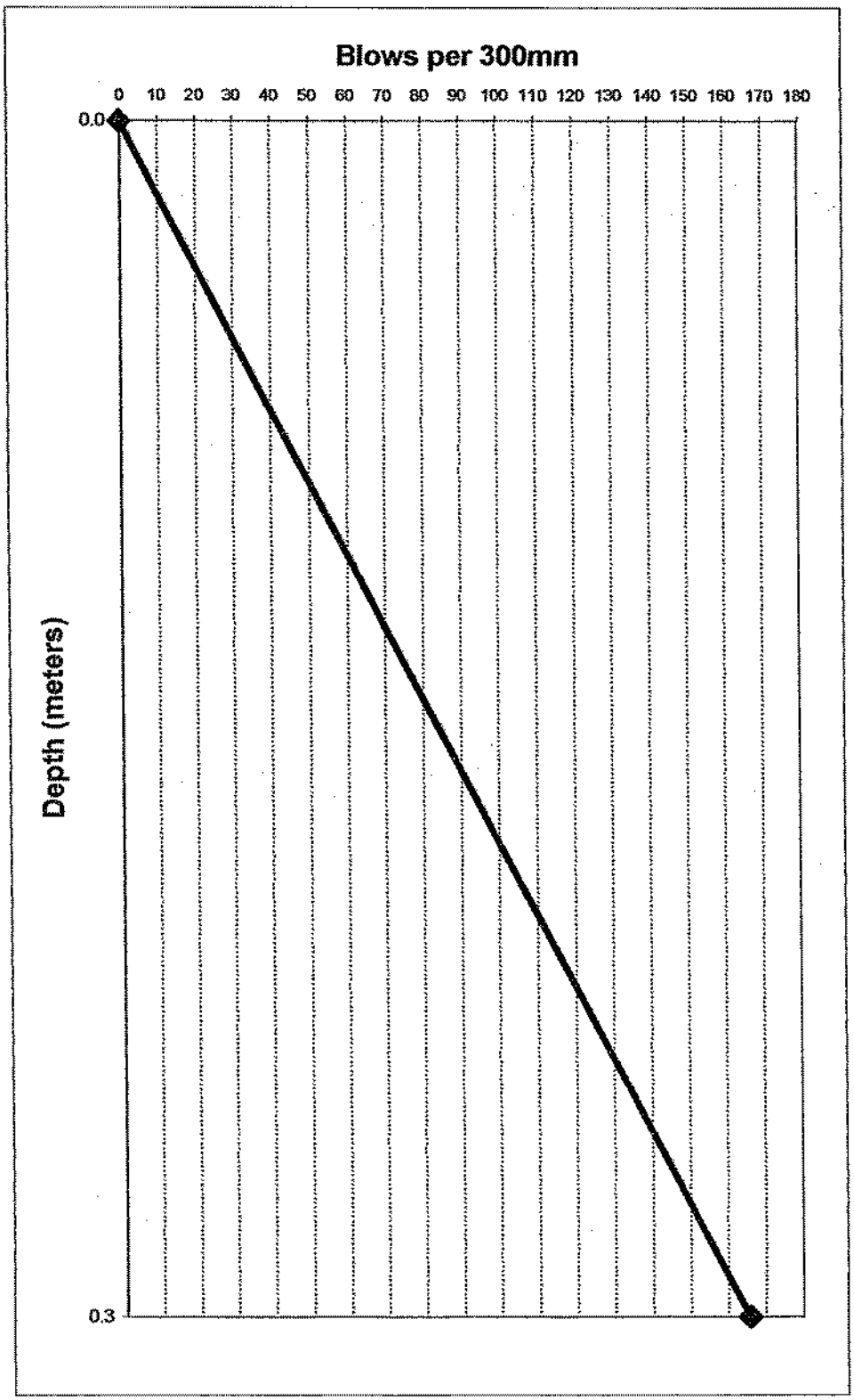
FIGURE C42



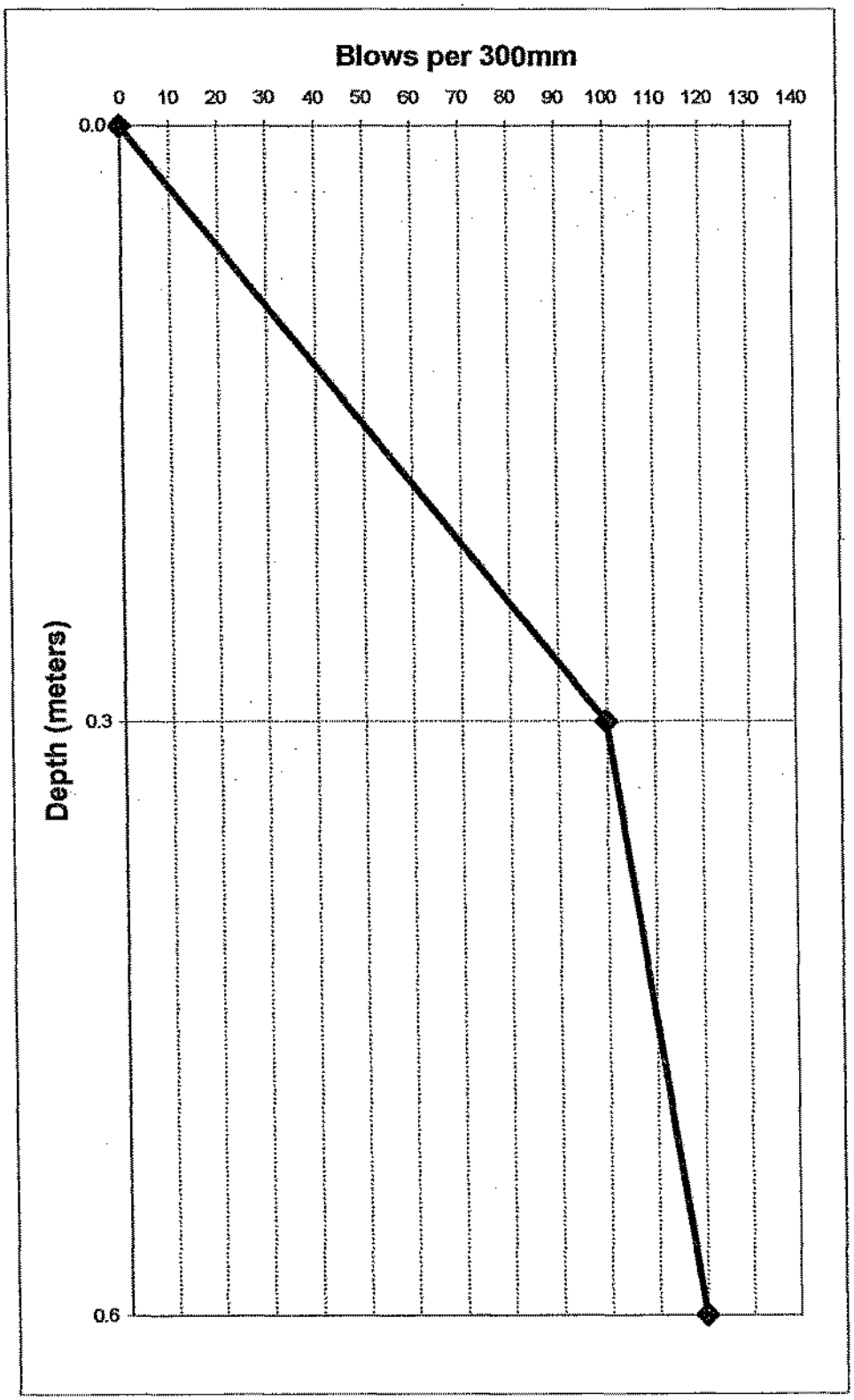
SOIL KRAFT

PENETRATION CURVE : DHSPT 43

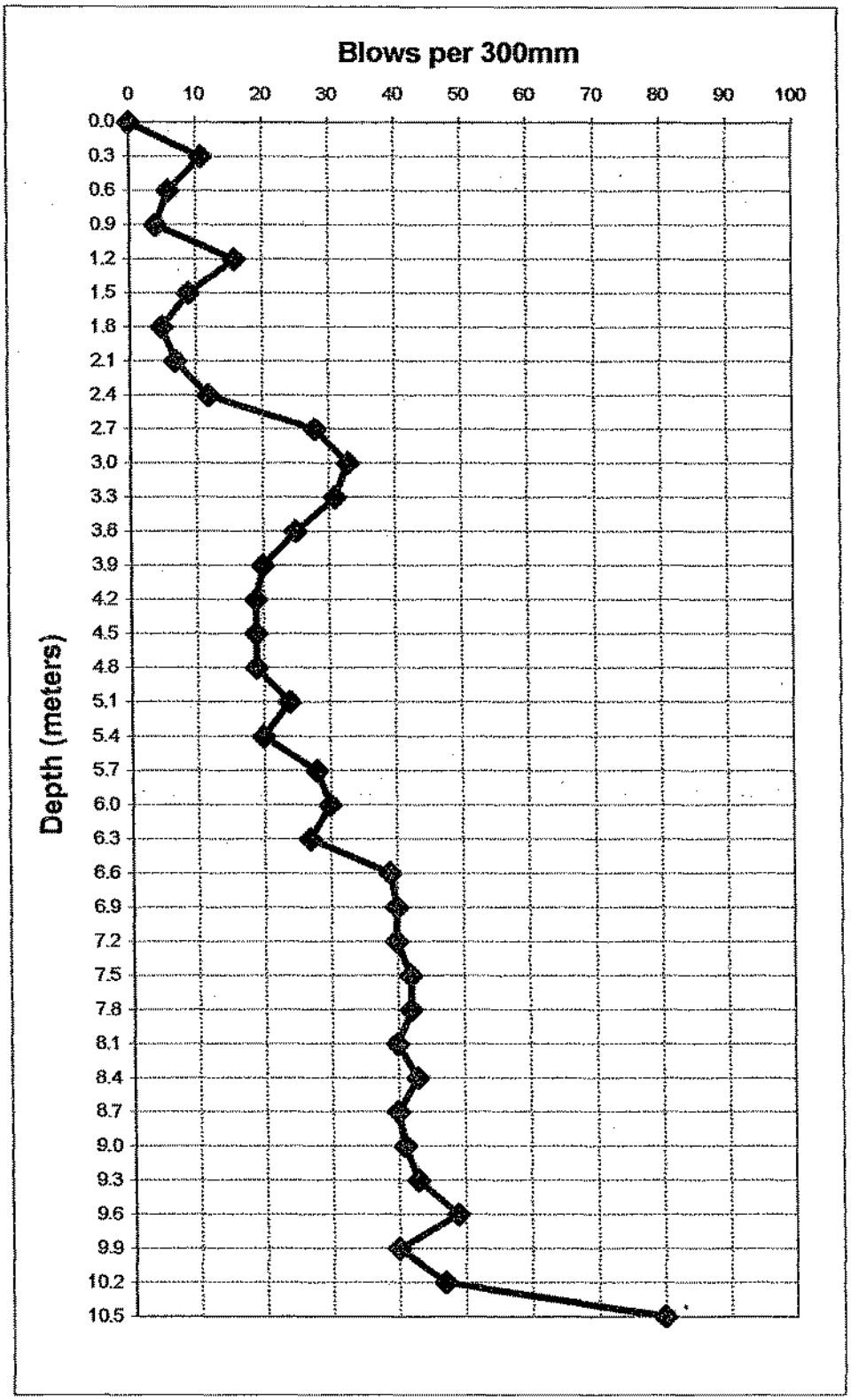
FIGURE C43



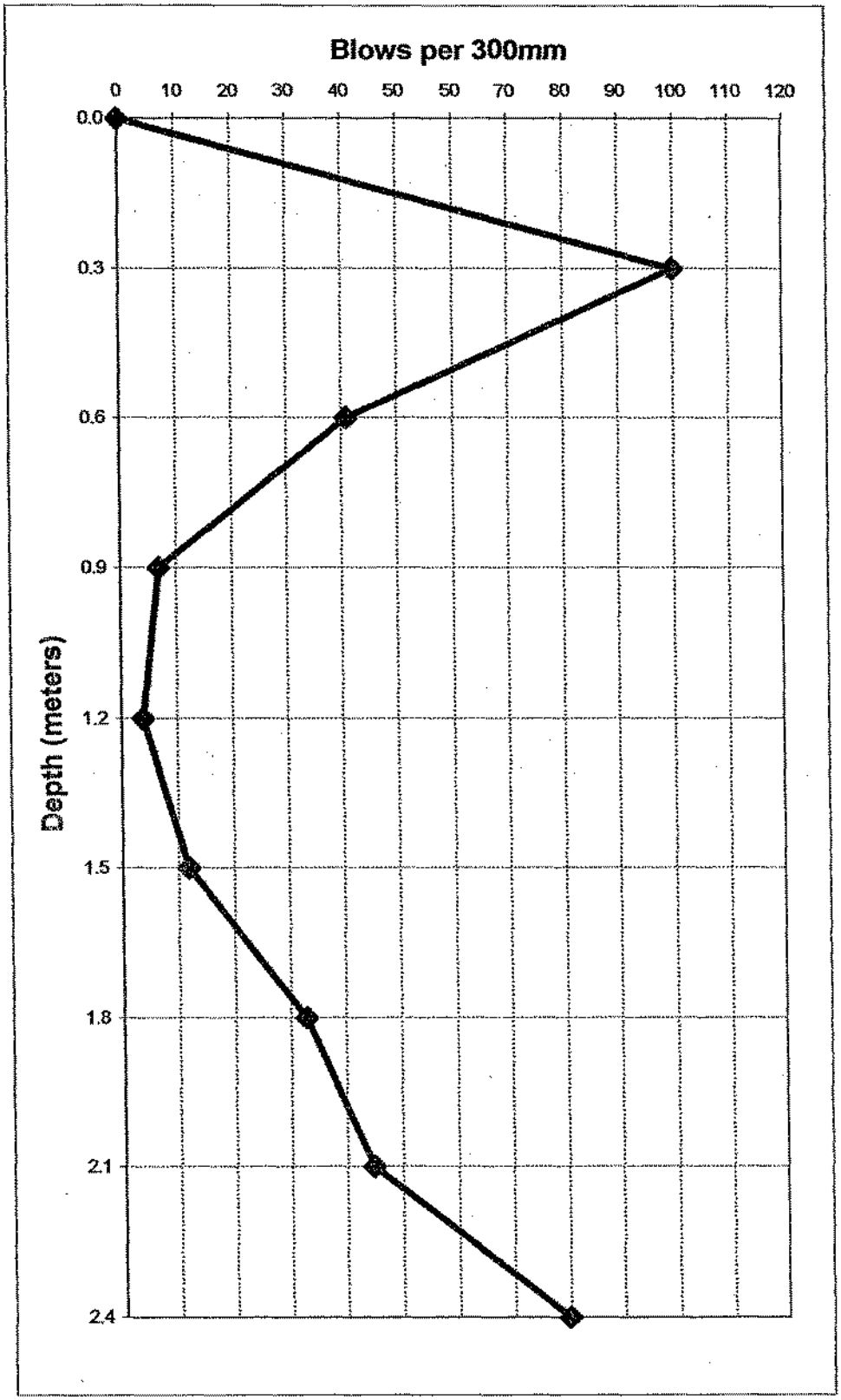
SOIL KRAFT	PENETRATION CURVE : DHSPT 44	FIGURE C44



SOIL KRAFT	PENETRATION CURVE : DHSPT 45	FIGURE C45



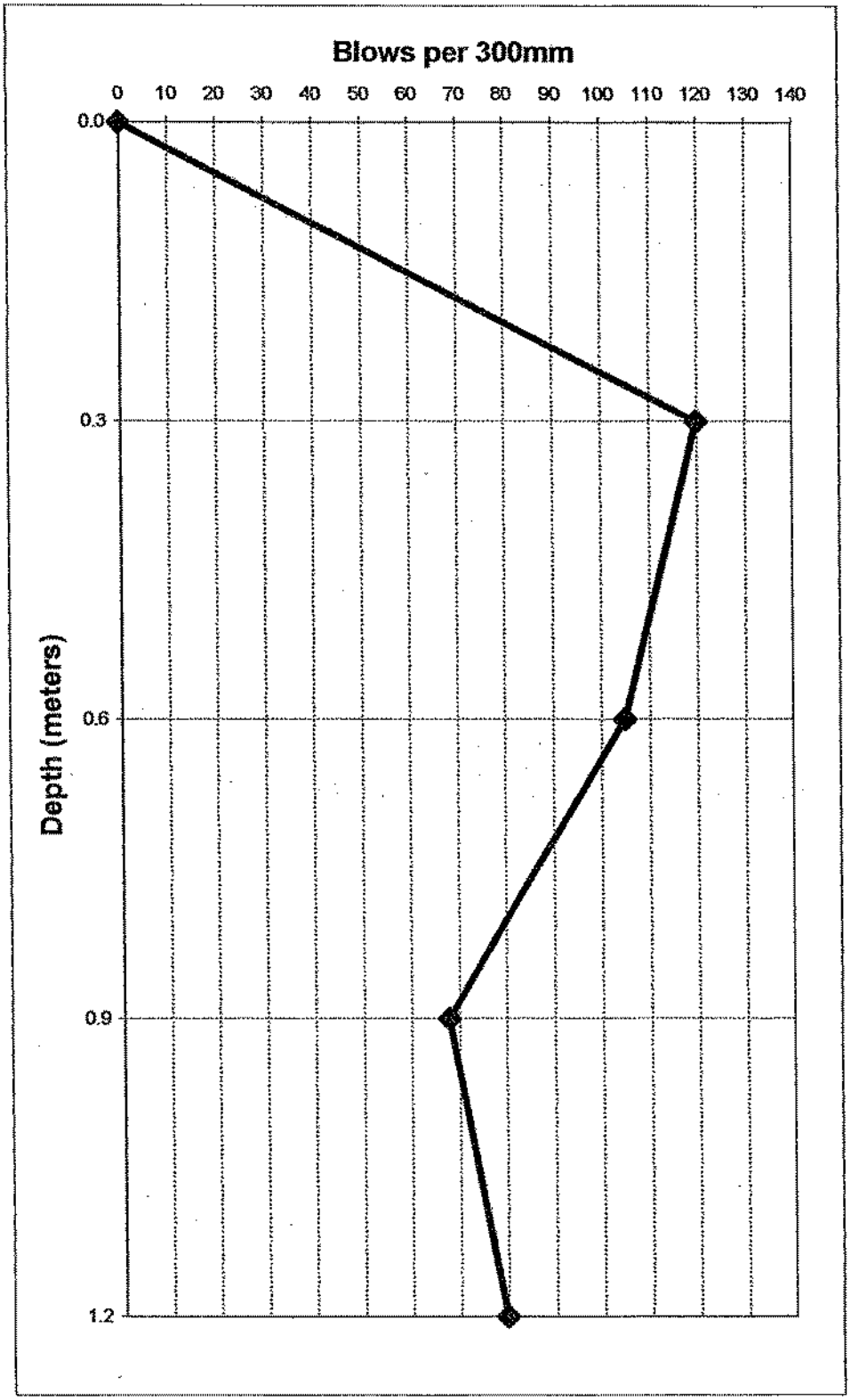
SOIL KRAFT	PENETRATION CURVE : DHSPT 46	FIGURE C46



SOIL KRAFT

PENETRATION CURVE : DHSPT 47

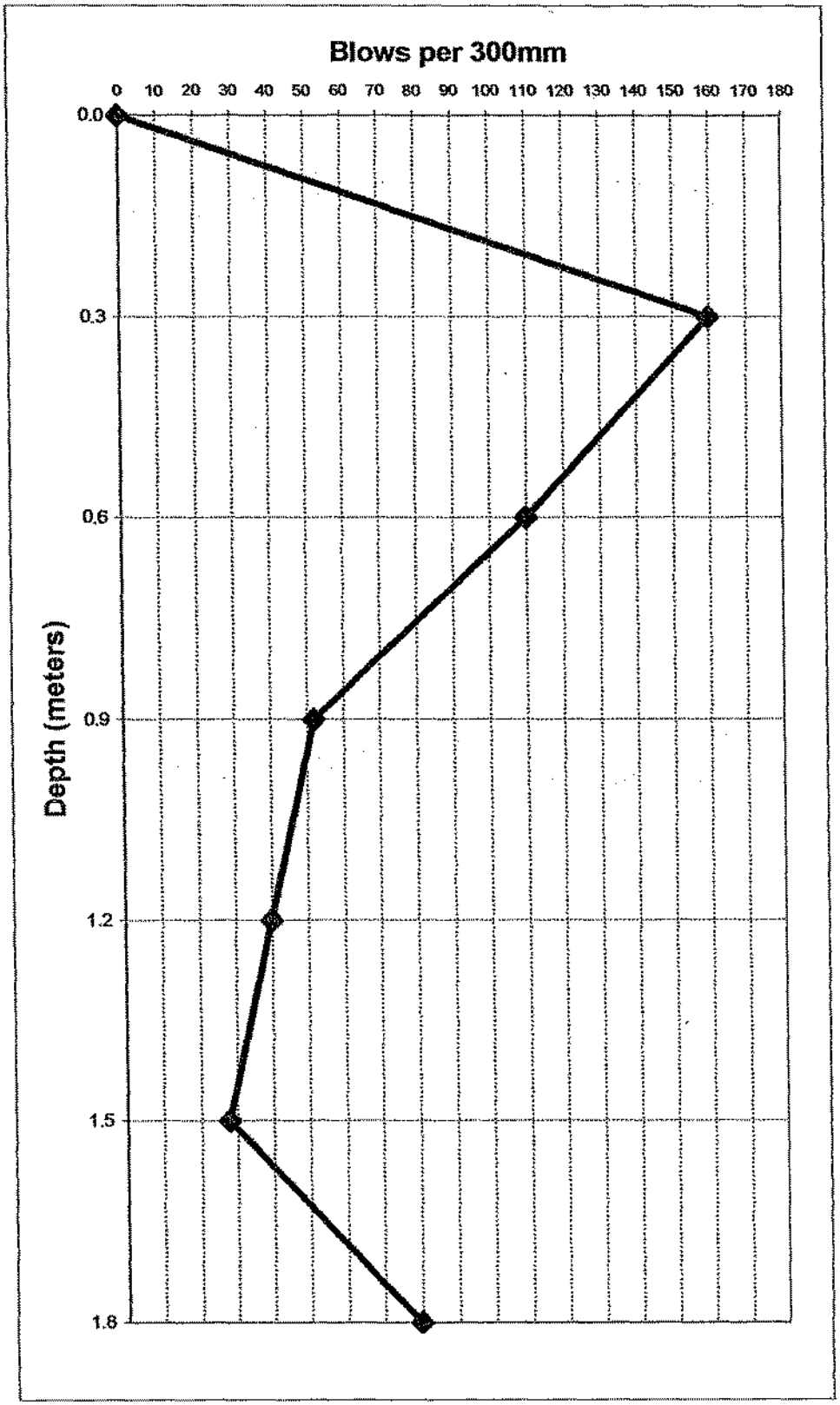
FIGURE C47



SOIL KRAFT

PENETRATION CURVE : DHSPT 48

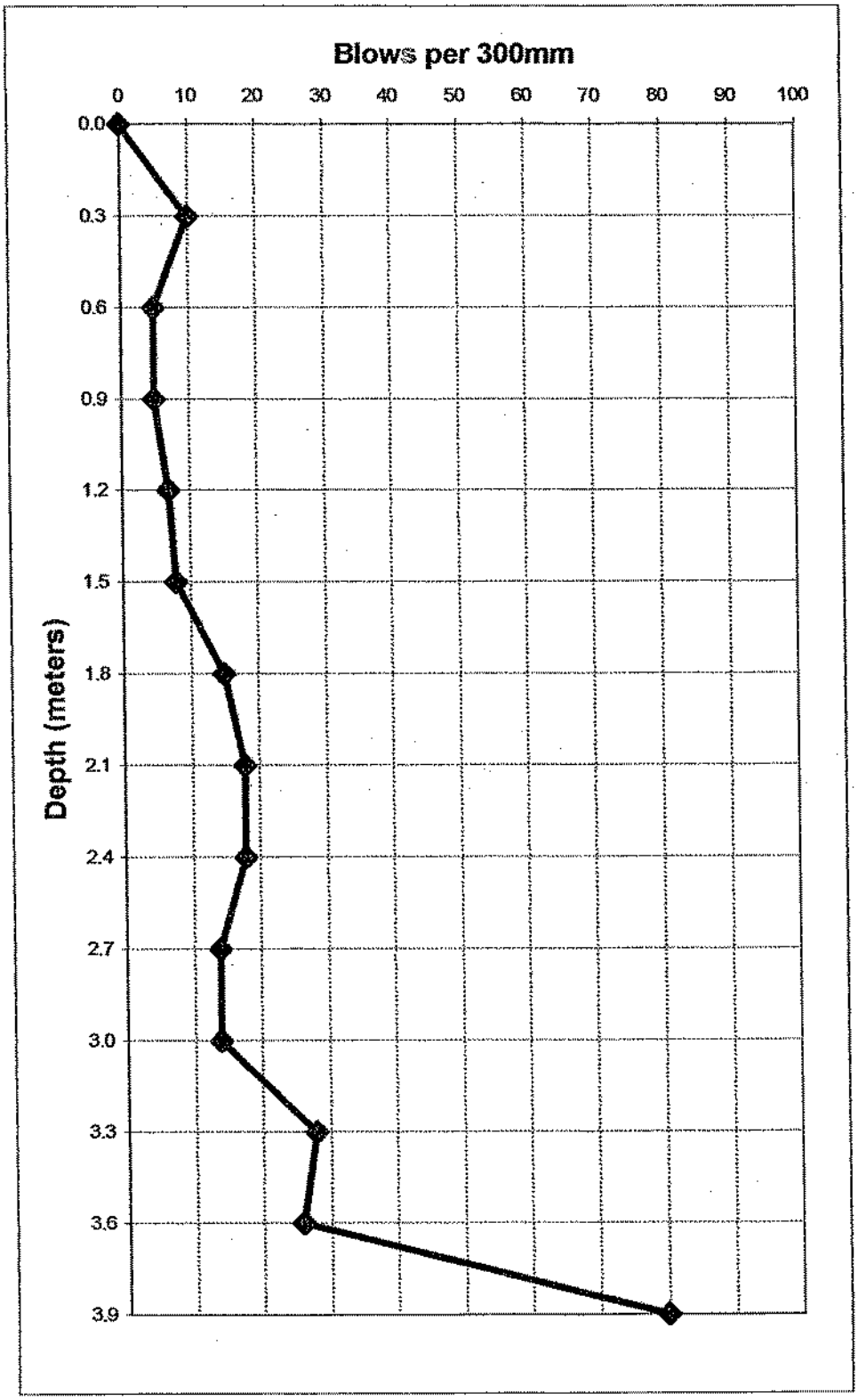
FIGURE C48



SOIL KRAFT

PENETRATION CURVE : DHSPT 49

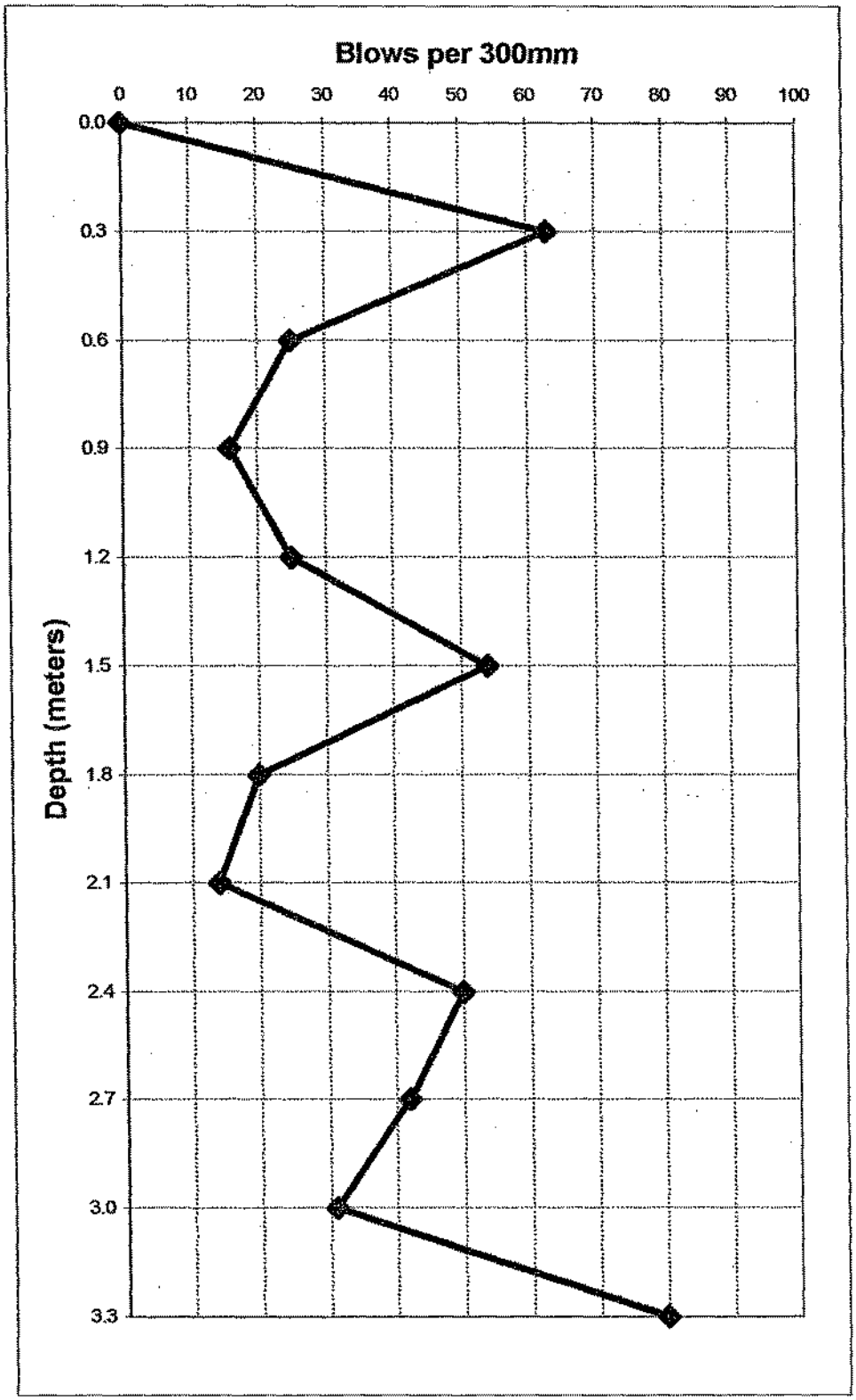
FIGURE C49



SOIL KRAFT

PENETRATION CURVE : DHSPT 50

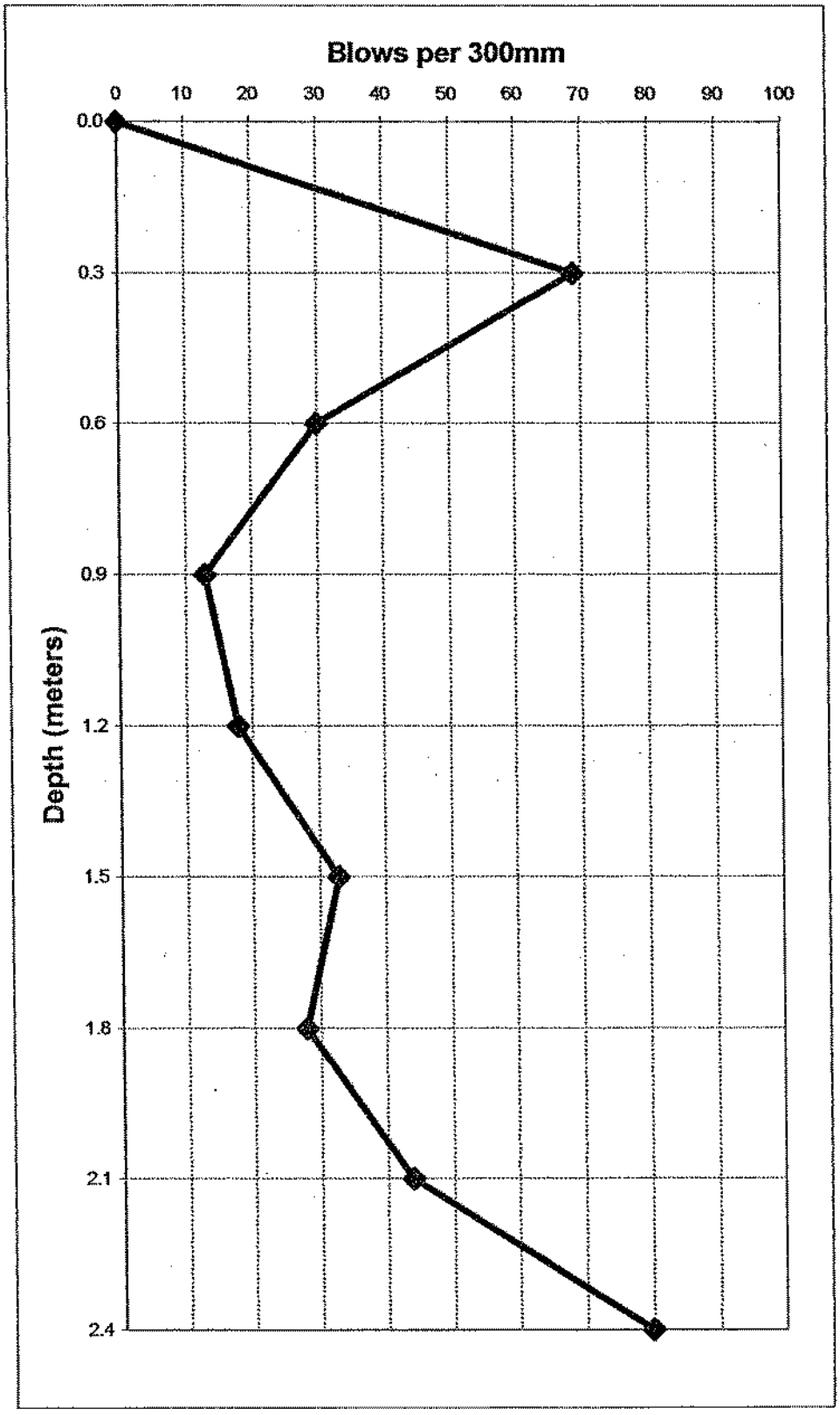
FIGURE C50



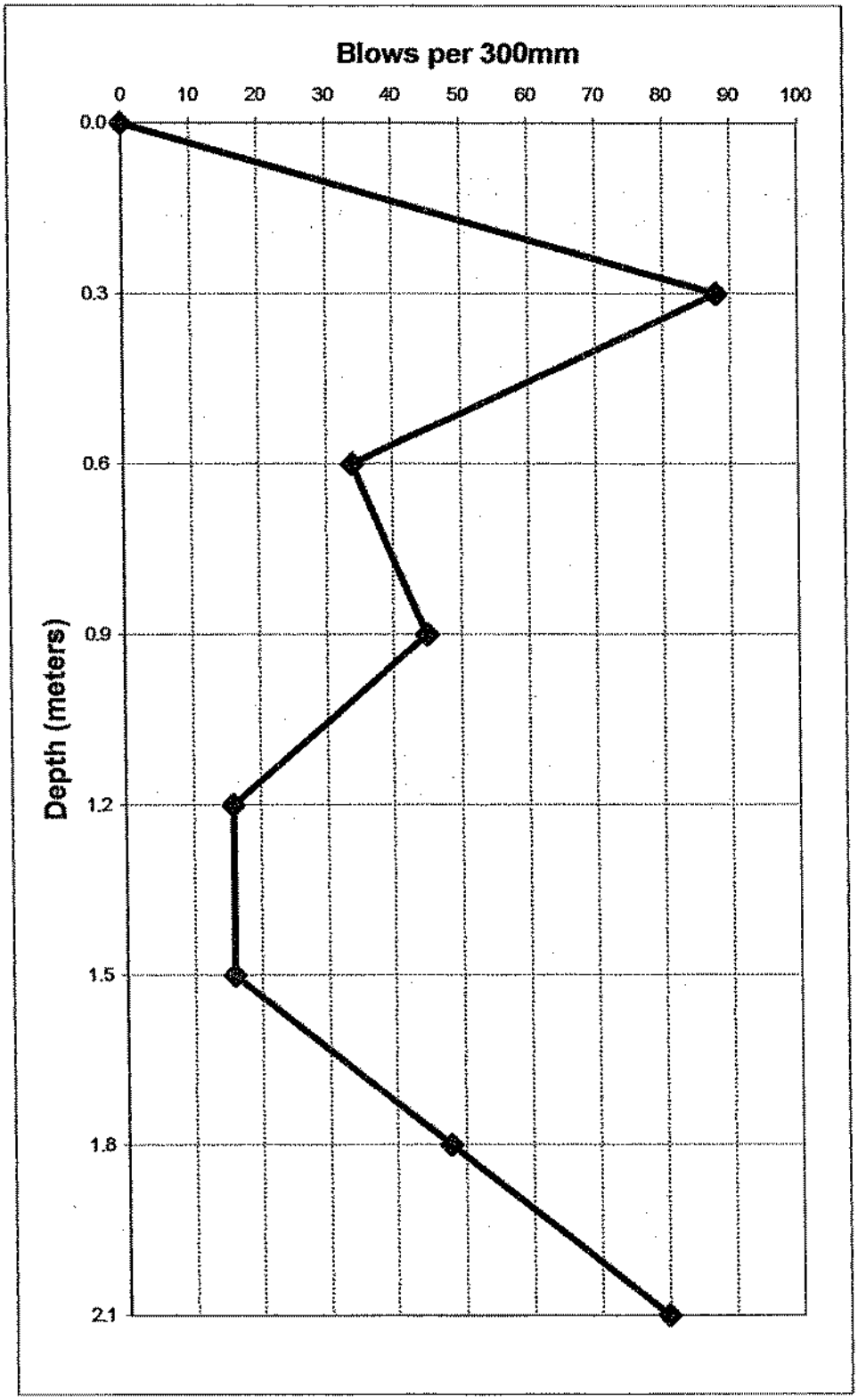
SOIL KRAFT

PENETRATION CURVE : DHSPT 51

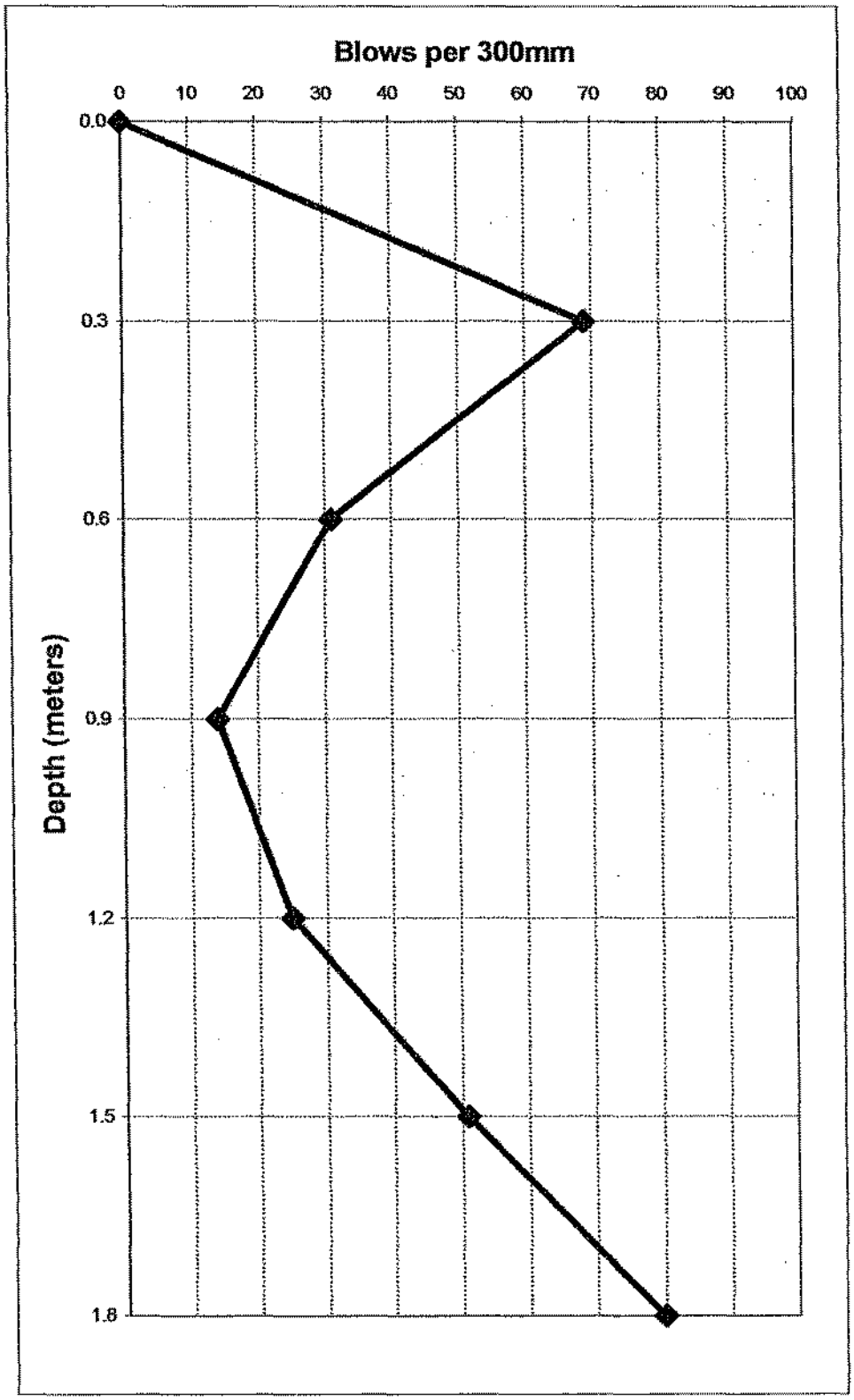
FIGURE C51



SOIL KRAFT	PENETRATION CURVE : DHSPT 52	FIGURE C52



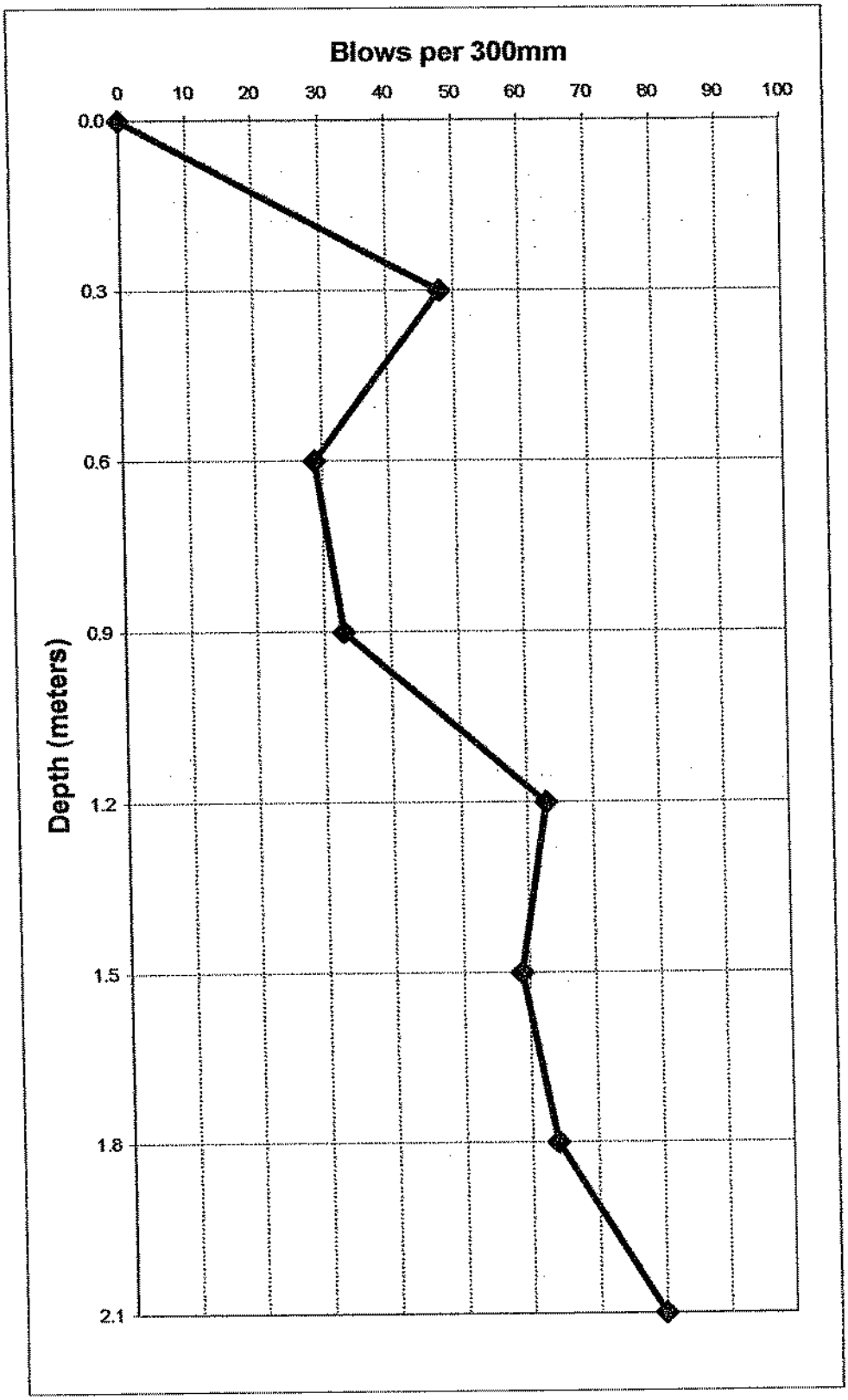
SOIL KRAFT	PENETRATION CURVE : DHSPT 53	FIGURE C53



SOIL KRAFT

PENETRATION CURVE : DH5PT 55

FIGURE C55



SOIL KRAFT

PENETRATION CURVE : DHSPT 56

FIGURE C56

ISCOR FLAT STEEL PRODUCTS VANDERBIJL PARK : PROPOSED MASTER PLAN FOR WASTE MANAGEMENT - FINAL GEOTECHNICAL REPORT

10 ADDENDUM D

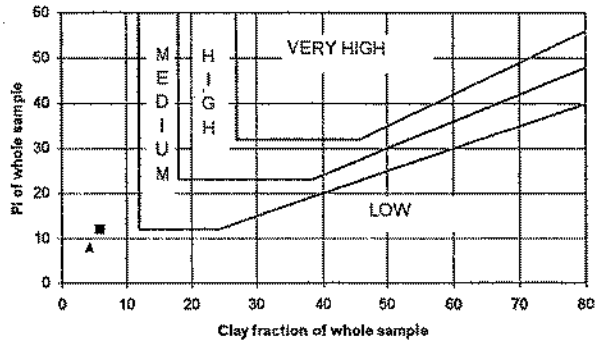
RESULTS OF SOIL TESTING

PARTICLE SIZE ANALYSIS

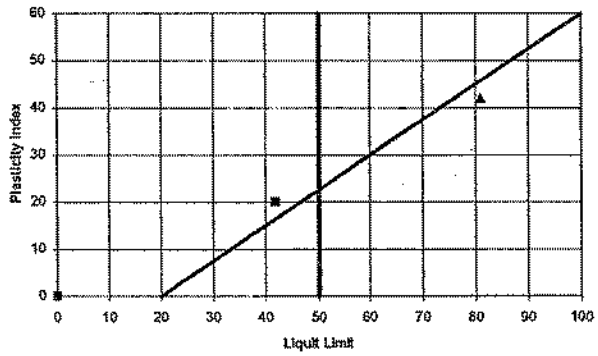
Sample / Hole No.	4594	4595
Depth (m)	1.4 - 2.2	0.9 - 1.9
Position	TP 2	TP 4
Material Description	DARK BROWN FERRICRETE SILTY SAND	LIGHT GREY CALCRETE SANDY GRAVEL
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	100
53.0 mm	100	100
37.5 mm	100	100
26.5 mm	100	100
19.0 mm	100	100
13.2 mm	98	96
4.75 mm	84	72
2.00 mm	71	38
0.425 mm	60	19
0.075 mm	46	14
HYDROMETER ANALYSIS		
0.040 mm	24	9
0.027 mm	20	8
0.013 mm	16	7
0.005 mm	11	6
0.002 mm	6	4
% Clay	6	4
% Silt	31	8
% Sand	34	26
% Gravel	29	62
ATTERBERG LIMITS		
Liquid Limit	42	81
Plasticity Index	20	42
Linear Shrinkage	10.0	18.0
Grading Modulus	1.23	2.29
Classification	A-7-6(5)	A-2-7(0)
Unified Classification	SC	SC
Chart Reference	■—■—■	▲—▲—▲

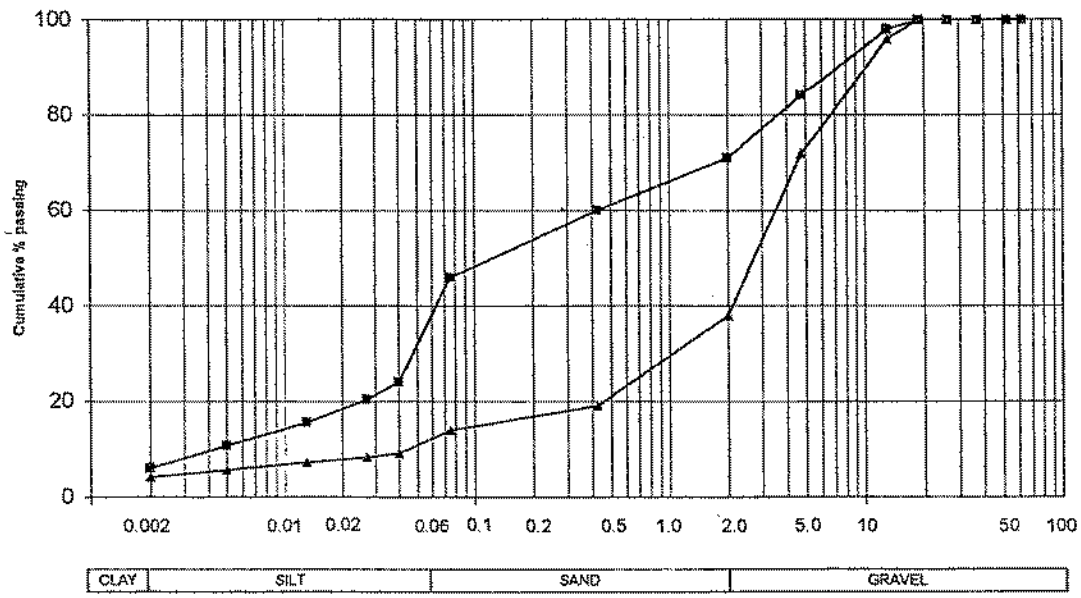
PROJECT : ISCOR FLAT STEEL PRODUCTS - NEW DAM
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





HIDROMETER/193-02

SOILLAB (PTY) LTD
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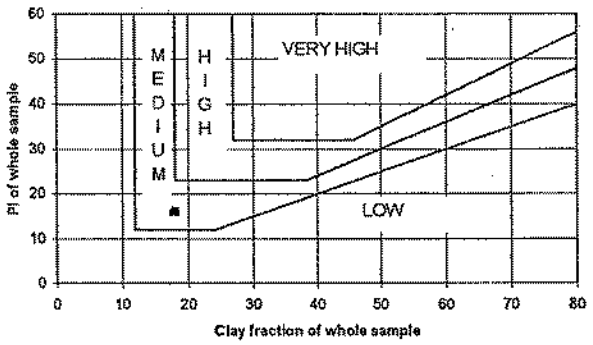
230 Albertus Street
La Montagne
Tel (012) 481-3900
P O Box 72928
Lynnwood Ridge 0040
Fax (012) 481-3812

PARTICLE SIZE ANALYSIS

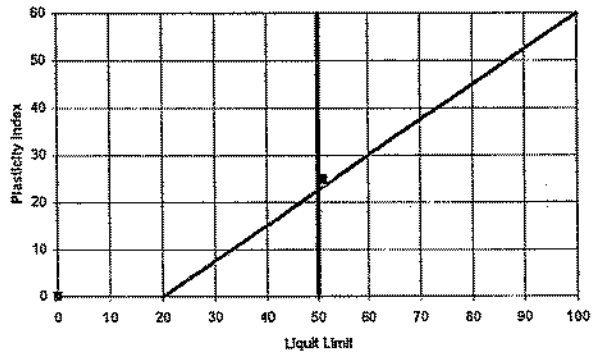
Sample / Hole No.	04596	
Depth (m)	1.1 - 2.5	
Position	TP 6	
Material Description	DARK YELLOW FERRICRETE SANDY GRAVEL	
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	
53.0 mm	100	
37.5 mm	100	
26.5 mm	100	
19.0 mm	100	
13.2 mm	100	
4.75 mm	76	
2.00 mm	69	
0.425 mm	64	
0.075 mm	47	
HYDROMETER ANALYSIS		
0.040 mm	33	
0.027 mm	31	
0.013 mm	28	
0.005 mm	23	
0.002 mm	18	
% Clay	18	
% Silt	23	
% Sand	28	
% Gravel	31	
ATTERBERG LIMITS		
Liquid Limit	51	
Plasticity Index	25	
Linear Shrinkage	11.0	
Grading Modulus	1.20	
Classification	A-7-6(8)	
Unified Classification	SC	
Chart Reference	✱—✱—✱	▲—▲—▲

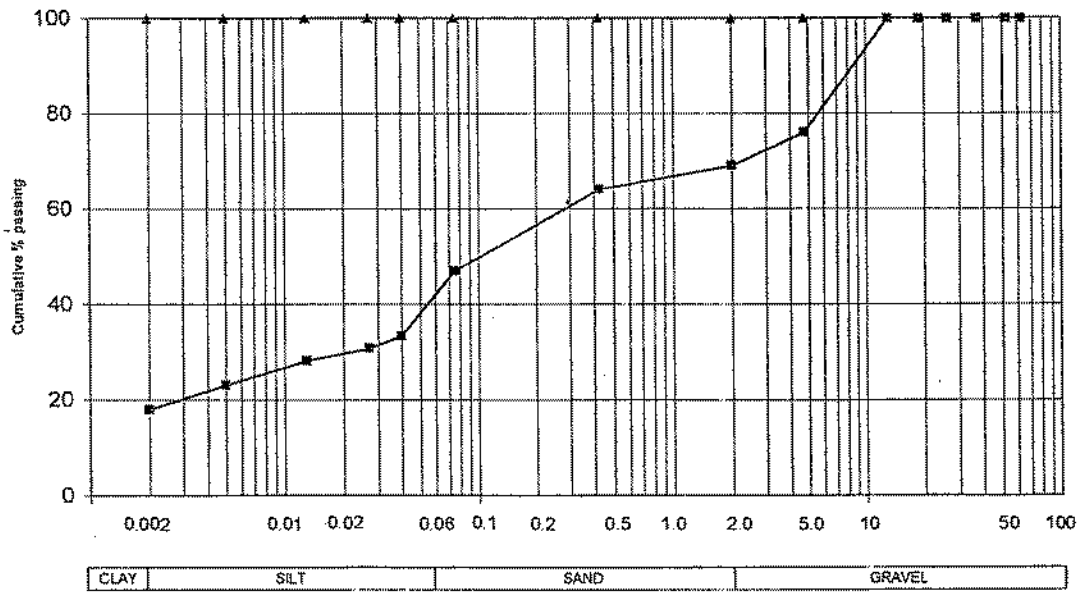
PROJECT : ISCOR FLAT STEEL PRODUCTS - NEW DAM
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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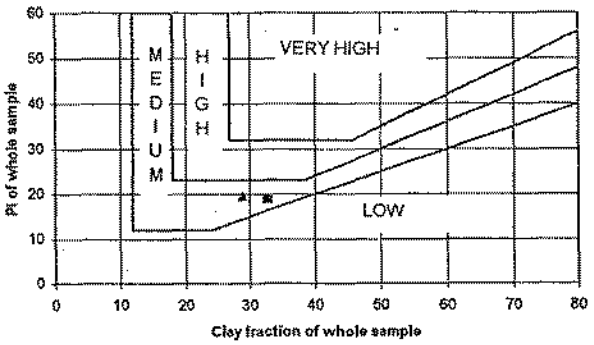
PARTICLE SIZE ANALYSIS

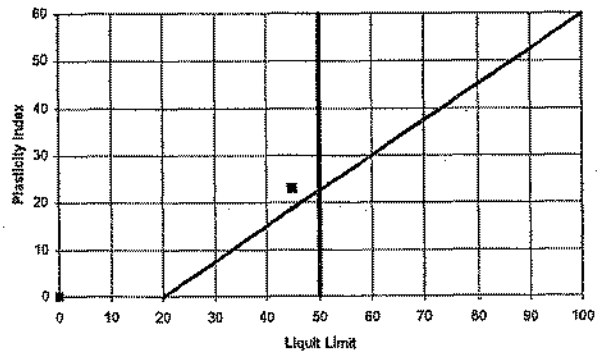
Sample / Hole No.	4592	4593
Depth (m)	0.4-2.0	0.2-1.2
Position	TP 9	TP 11
Material Description	DARK BROWN FERRICRETE CLAYEY SAND	DARK BROWN FERRICRETE CLAYEY SAND
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	100
53.0 mm	100	100
37.5 mm	100	100
26.5 mm	100	100
19.0 mm	100	100
13.2 mm	98	100
4.75 mm	91	97
2.00 mm	86	94
0.425 mm	82	85
0.075 mm	58	59
HYDROMETER ANALYSIS		
0.040 mm	43	42
0.027 mm	38	37
0.013 mm	36	36
0.005 mm	34	32
0.002 mm	33	29
% Clay	33	28
% Silt	19	23
% Sand	35	42
% Gravel	14	6
ATTERBERG LIMITS		
Liquid Limit	45	45
Plasticity Index	23	23
Linear Shrinkage	10.5	10.5
Grading Modulus	0.74	0.62
Classification	A-7-6(10)	A-7-6(11)
Unified Classification	CL	CL
Chart Reference	■—■—■	▲—▲—▲

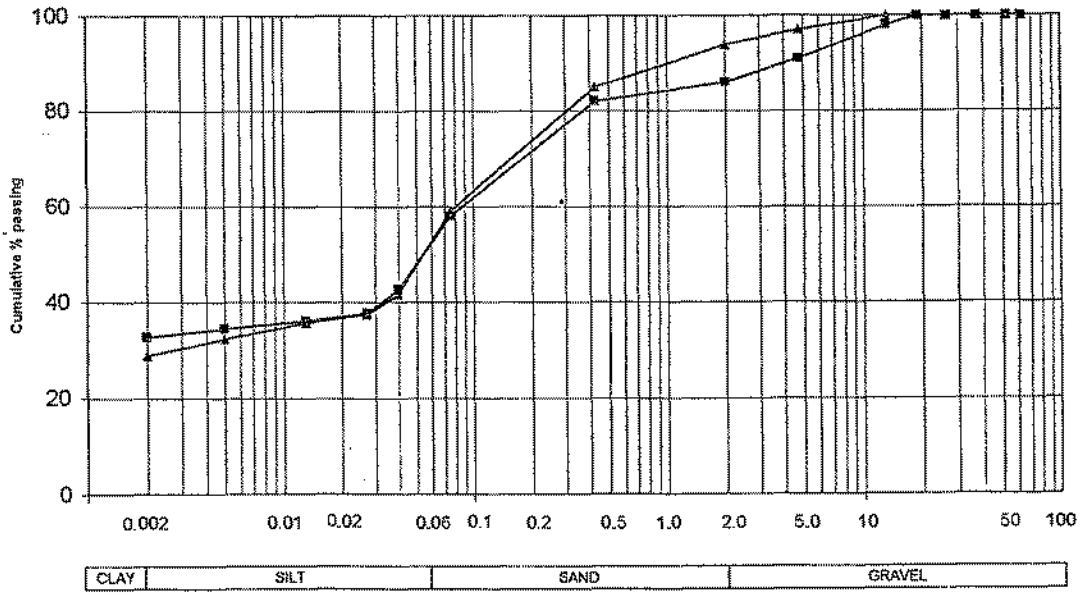
PROJECT : ISCOR FLAT STEEL PRODUCTS - NEW DAM
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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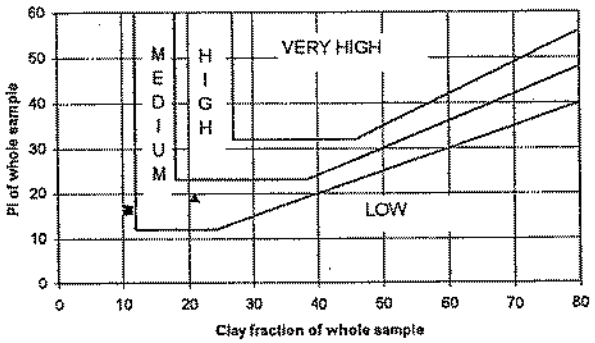
PARTICLE SIZE ANALYSIS

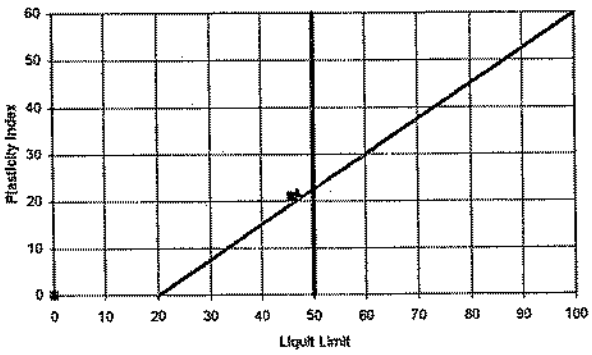
Sample / Hole No.	4597	4598
Depth (m)	1.9 - 2.8	1.9 - 2.7
Position	TP 2	TP 4
Material Description	DARK YELLOW FERRICRETE SANDY SILT	DARK YELLOW FERRICRETE SANDY SILT
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	100
53.0 mm	100	100
37.5 mm	100	100
26.5 mm	100	100
19.0 mm	100	100
13.2 mm	100	100
4.75 mm	93	99
2.00 mm	86	93
0.425 mm	78	87
0.075 mm	66	72
HYDROMETER ANALYSIS		
0.040 mm	31	47
0.027 mm	27	42
0.013 mm	22	35
0.005 mm	16	26
0.002 mm	11	21
% Clay	11	21
% Silt	40	40
% Sand	35	32
% Gravel	14	7
ATTERBERG LIMITS		
Liquid Limit	46	47
Plasticity Index	21	22
Linear Shrinkage	10.0	10.0
Grading Modulus	0.70	0.48
Classification	A-7-6(11)	A-7-6(14)
Unified Classification	CL	CL
Chart Reference	✱-✱-✱	▲-▲-▲

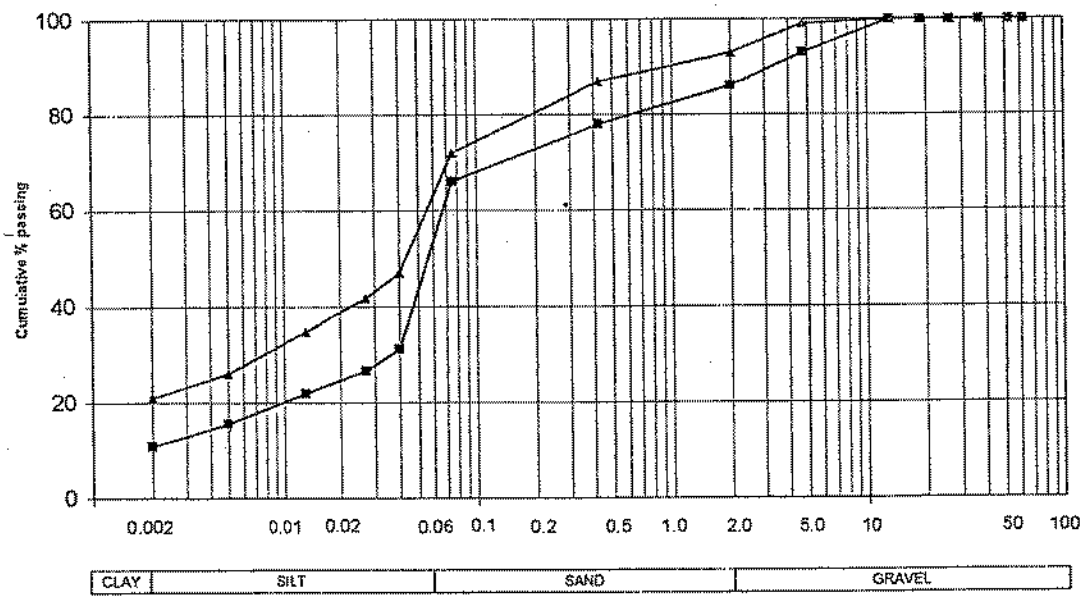
PROJECT : ISCOR FLAT STEEL PRODUCTS - WASTE SITE
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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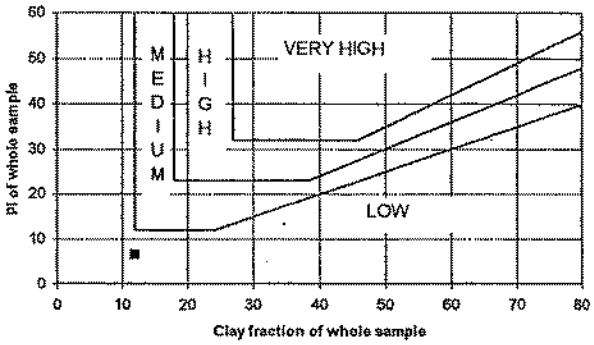
PARTICLE SIZE ANALYSIS

Sample / Hole No.	4599	
Depth (m)	1.9 - 2.8	
Position	TP 7	
Material Description	DARK BROWN SHALE SANDY GRAVEL	
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	
53.0 mm	100	
37.5 mm	100	
26.5 mm	100	
19.0 mm	100	
13.2 mm	99	
4.75 mm	81	
2.00 mm	64	
0.425 mm	50	
0.075 mm	40	
HYDROMETER ANALYSIS		
0.040 mm	28	
0.027 mm	26	
0.013 mm	22	
0.005 mm	15	
0.002 mm	12	
% Clay	12	
% Silt	23	
% Sand	29	
% Gravel	36	
ATTERBERG LIMITS		
Liquid Limit	33	
Plasticity Index	13	
Linear Shrinkage	6.5	
Grading Modulus	1.46	
Classification	A-6(2)	
Unified Classification	SC	
Chart Reference	■—■—■	▲—▲—▲

PROJECT : ISCOR FLAT STEEL PRODUCTS - WASTE SITE
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



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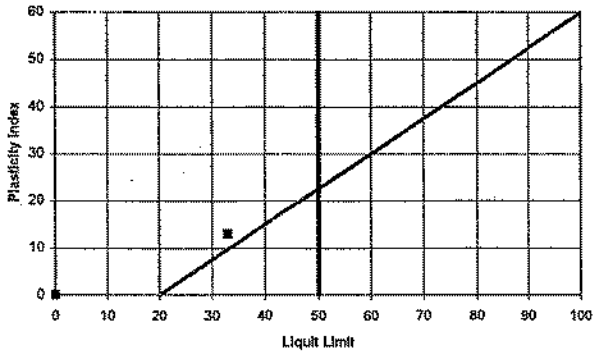

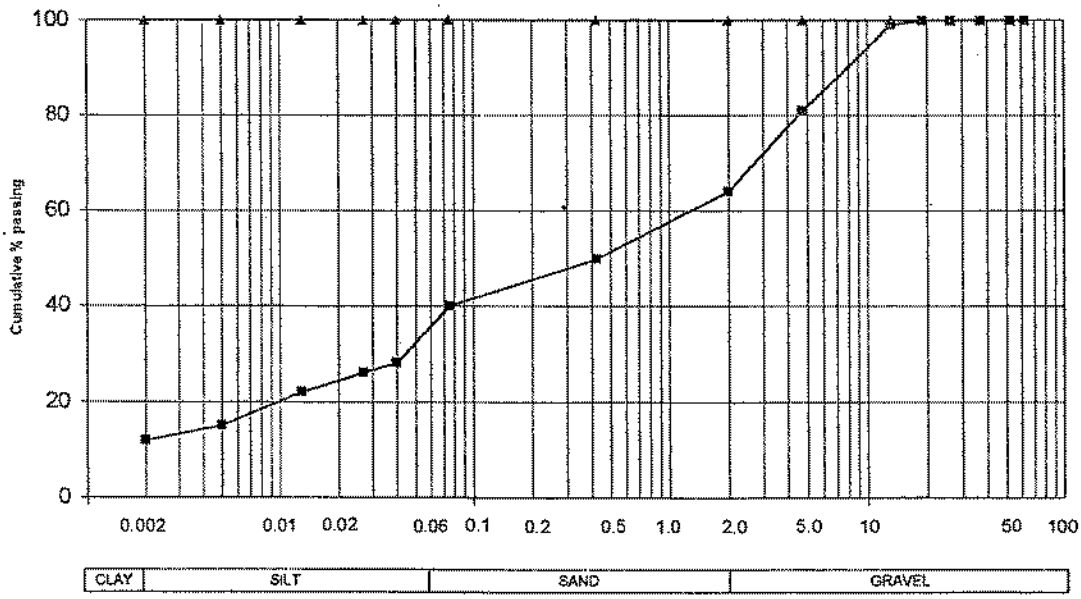

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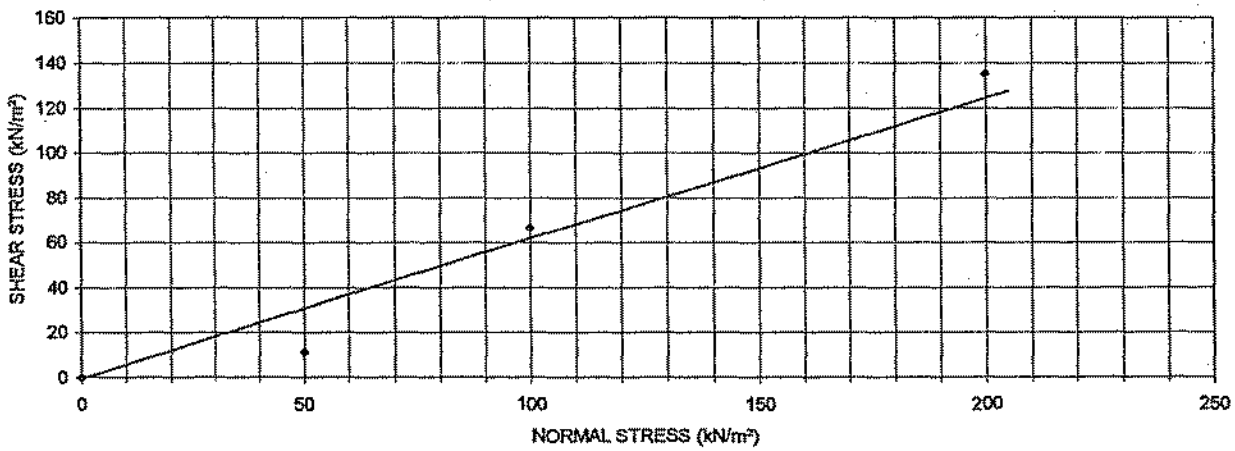
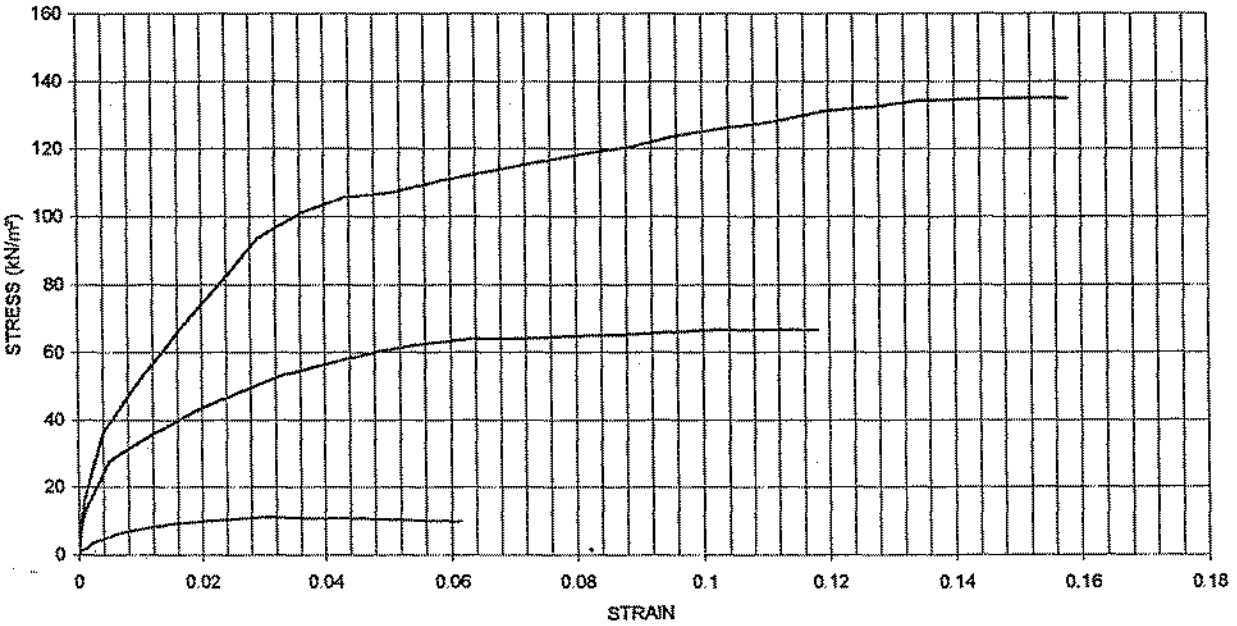
DIRECT SHEAR TEST

PROJECT ISCOR

SAMPLE NO.	SAMPLE DEPTH (m)	NORMAL STRESS (kN/m²)	PEAK SHEAR		PEAK ANGLE OF INTERNAL FRICTION (DEG)	COHESION (kN/m²)	OPTIMUM MOISTURE (%)	MOISTURE AFTER TEST (%)	PROCTOR DRY DENSITY (kg/m³)
			STRESS (kN/m²)	DISPLACEMENT (mm)					
TP	0.9-1.9	50	11.2	1.50				32.5	
ND 4		100	66.6	5.14	38.8	0.0	21.4	33.3	1540
		200	134.9	7.52				34.7	





NOTE(1): THE ABOVE REMOULDED SOIL SAMPLE WERE TESTED IN A SATURATED CONDITION UNDER SELECTED NORMAL LOADS IN A 50 mm DIAMETER BOX USING A CONTROLLED RATE OF DISPLACEMENT OF 0.1307 mm PER MINUTE.

NOTE(2):THE ABOVE SAMPLES WERE COMPACTED TO 95 % OF PROCTOR DRY DENSITY @ OPTIMUM MOISTURE CONDITION.

BOXSHR/193-01

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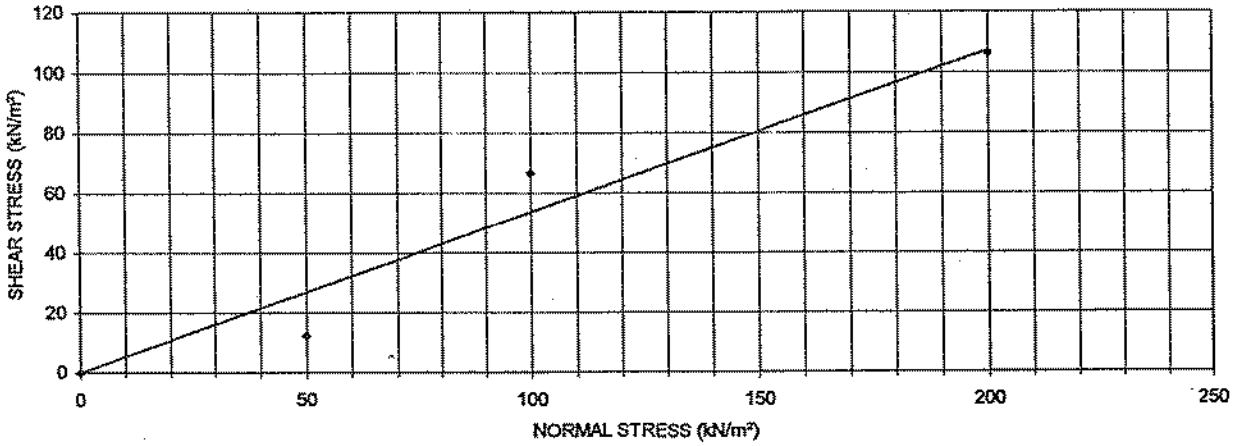
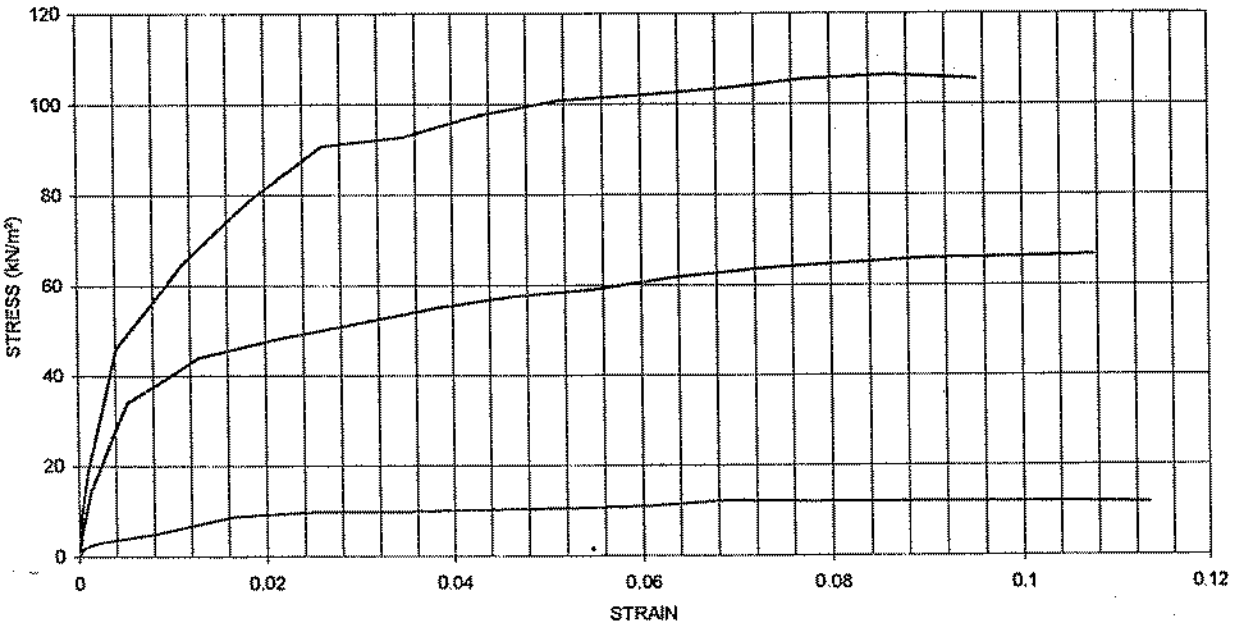
DIRECT SHEAR TEST

PROJECT ISCOR

SAMPLE NO.	SAMPLE DEPTH (m)	NORMAL STRESS (kN/m²)	PEAK SHEAR		PEAK ANGLE OF INTERNAL FRICTION (DEG)	COHESION (kN/m²)	OPTIMUM MOISTURE (%)	MOISTURE AFTER TEST (%)	PROCTOR DRY DENSITY (kg/m³)
			STRESS (kN/m²)	DISPLACEMENT (mm)					
TP	0.4-2.0	50	12.3	3.47				25.9	
		100	66.6	5.39	30.7	0.0	18.1	24.1	1638
ND 9		200	106.4	4.33				22.7	





NOTE(1): THE ABOVE REMOULDED SOIL SAMPLE WERE TESTED IN A SATURATED CONDITION UNDER SELECTED NORMAL LOADS IN A 50 mm DIAMETER BOX USING A CONTROLLED RATE OF DISPLACEMENT OF 0.1473 mm PER MINUTE.

NOTE(2):THE ABOVE SAMPLES WERE COMPACTED TO 95 % OF PROCTOR DRY DENSITY @ OPTIMUM MOISTURE CONDITION.

BOXSHR/193-02

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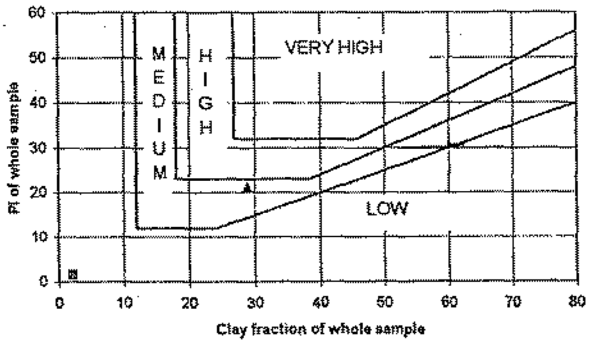
PARTICLE SIZE ANALYSIS

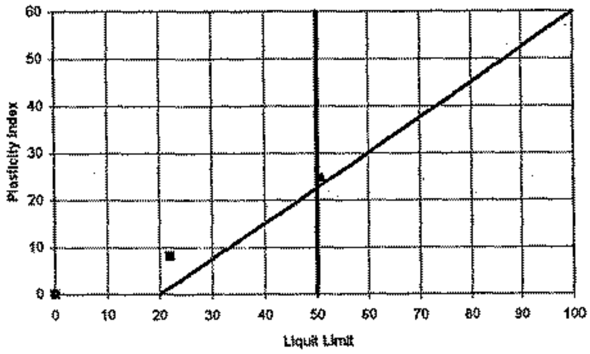
PROJECT : ISCOR FLAT STEEL PRODUCTS - EXSISTING DAMS
JOB NR. : S02-193
DATE : 2002-03-01

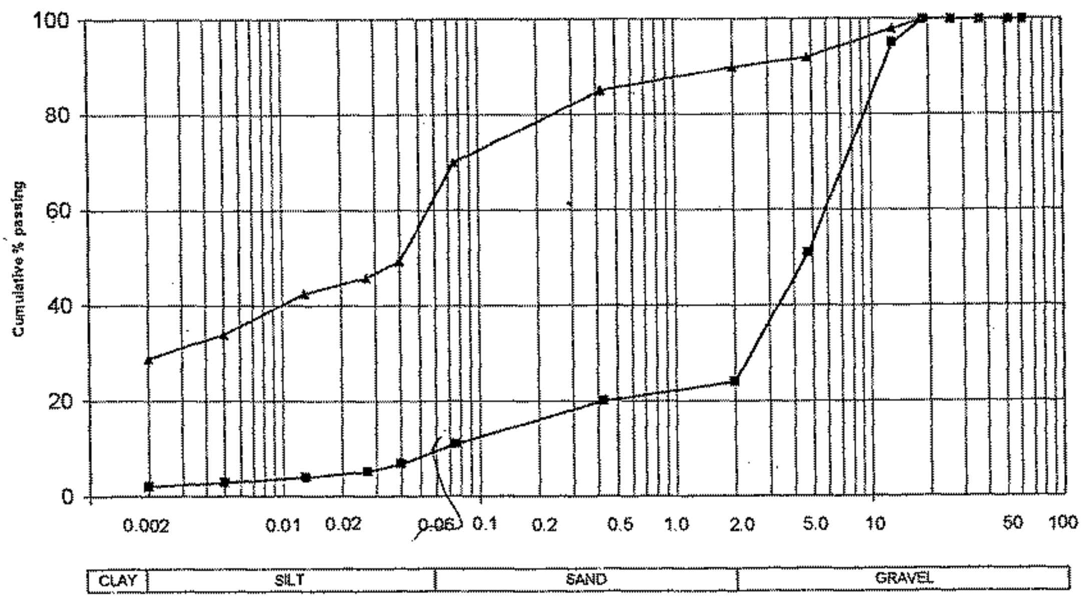
Sample / Hole No.	4600	4601
Depth (m)	0.7 - 0.8	1.0-2.5
Position	TP 6	TP 10
Material Description	DARK BROWN FERRICRETE SANDY GRAVEL	DARK R/O FERRICRETE CLAYEY SILT
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	100
53.0 mm	100	100
37.5 mm	100	100
26.5 mm	100	100
19.0 mm	100	100
13.2 mm	95	98
4.75 mm	51	92
2.00 mm	24	90
0.425 mm	20	85
0.075 mm	11	70
HYDROMETER ANALYSIS		
0.040 mm	7	49
0.027 mm	5	46
0.013 mm	4	43
0.005 mm	3	34
0.002 mm	2	29
% Clay	2	29
% Silt	7	32
% Sand	15	29
% Gravel	76	10
ATTERBERG LIMITS		
Liquid Limit	22	51
Plasticity Index	8	25
Linear Shrinkage	4.0	10.5
Grading Modulus	2.45	0.55
Classification	A-2-4(0)	A-7-6(15)
Unified Classification	SP & SC	CH
Chart Reference	■—■—■	▲—▲—▲

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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CLIENT : SOILKRAFT

PROJECT : ISCOR

PROJECT NO. : S02-193

DATE : 2002-04-08

PERMEABILITY ON REMOULDED SAMPLES

Sample (no)	Depth (m)	Max. Proctor dry density (kg/m^3)	Optimum moisture content (%)	Compaction as percent of Max. Proctor dry density (%)	Head of water (cm)	Coefficient of permeability (cm/s)
TP ND2	1.4-2.2	1642	19.8	95.0	51.0	5.033×10^{-6}
TP NW2	1.9-2.8	1614	20.4	95.0	51.0	1.117×10^{-5}
TP NW7	1.9-2.8	1789	13.9	90.0	51.0	6.669×10^{-4}
TP ED10	1.0-2.5	1528	21.9	90.0	51.0	3.668×10^{-5}
TP ND11	0.2-1.2	1593	17.3	95.0	51.0	1.083×10^{-5}

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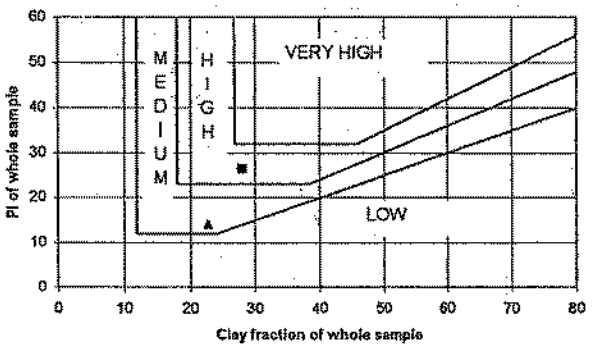
PARTICLE SIZE ANALYSIS

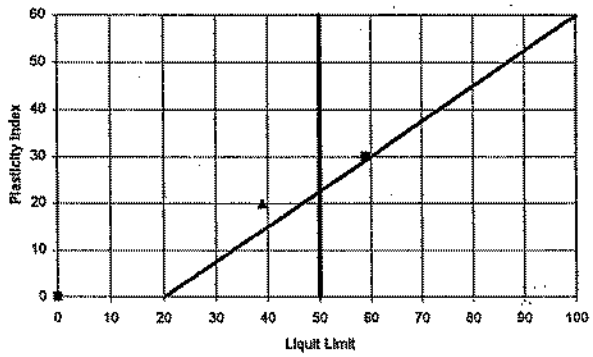
Sample / Hole No.	4602	4603
Depth (m)	0.85 - 2.9	1.5-2.85
Position	TP 1	TP 3
Material Description	DARK OLIVE FERRICRETE SILTY SAND	DARK YELLOW FERRICRETE GRAVELLY SAND
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	100
53.0 mm	100	100
37.5 mm	100	100
26.5 mm	100	100
19.0 mm	100	100
13.2 mm	100	100
4.75 mm	96	82
2.00 mm	92	76
0.425 mm	88	71
0.075 mm	66	50
HYDROMETER ANALYSIS		
0.040 mm	46	34
0.027 mm	42	31
0.013 mm	40	28
0.005 mm	35	26
0.002 mm	28	23
% Clay	28	23
% Silt	29	20
% Sand	35	33
% Gravel	8	24
ATTERBERG LIMITS		
Liquid Limit	59	39
Plasticity Index	30	20
Linear Shrinkage	13.5	9.0
Grading Modulus	0.54	1.03
Classification	A-7-6(17)	A-6(7)
Unified Classification	CH	CL
Chart Reference	■—■—■	▲—▲—▲

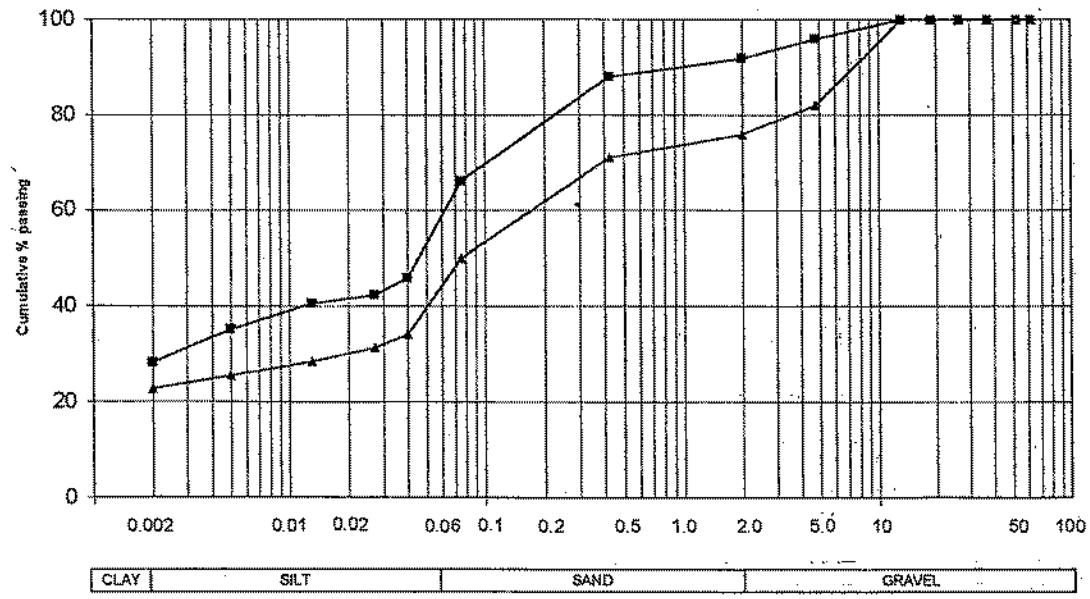
PROJECT : ISCOR FLAT STEEL PRODUCTS - CLAY LINER
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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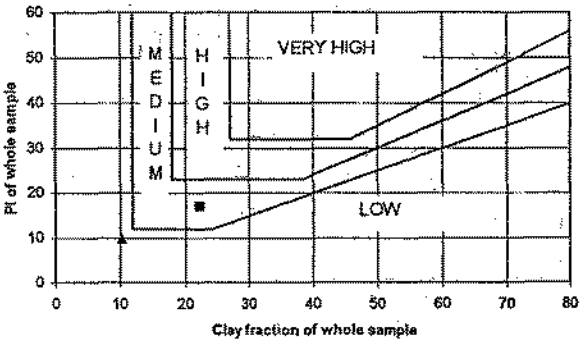
PARTICLE SIZE ANALYSIS

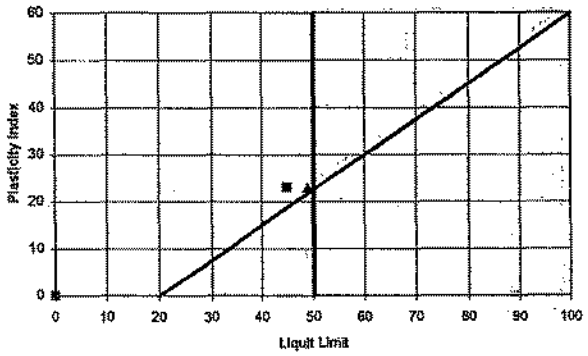
Sample / Hole No.	4604	4605
Depth (m)	0-1.1	0.95-2.9
Position	TP 5	TP 8
Material Description	DARK GREY FERRICRETE CLAYEY SAND	DARK BROWN FERRICRETE SANDY GRAVEL
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	100
53.0 mm	100	100
37.5 mm	100	100
26.5 mm	100	100
19.0 mm	100	100
13.2 mm	100	100
4.75 mm	99	82
2.00 mm	94	58
0.425 mm	74	43
0.075 mm	47	32
HYDROMETER ANALYSIS		
0.040 mm	34	20
0.027 mm	31	17
0.013 mm	30	15
0.005 mm	25	12
0.002 mm	22	10
% Clay	22	10
% Silt	19	16
% Sand	53	31
% Gravel	6	42
ATTERBERG LIMITS		
Liquid Limit	45	49
Plasticity Index	23	23
Linear Shrinkage	10.5	10.0
Grading Modulus	0.85	1.67
Classification	A- 7 -6(7)	A-2 7(2)
Unified Classification	SC	SC
Chart Reference	■—■—■	▲—▲—▲

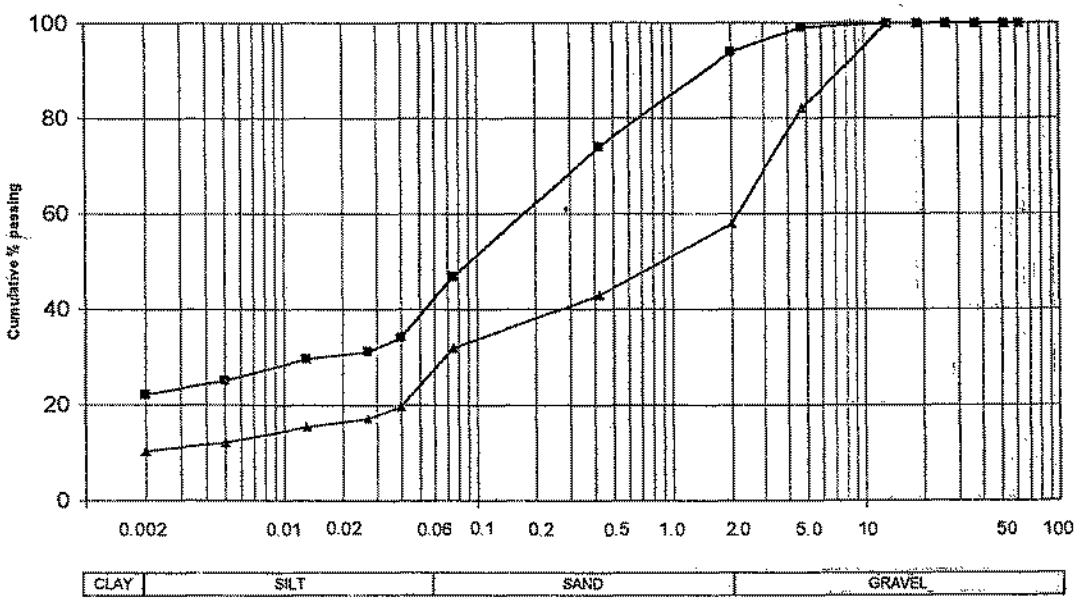
PROJECT : ISCOR FLAT STEEL PRODUCTS - CLAY LINER
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





HIDROMETER/193-08

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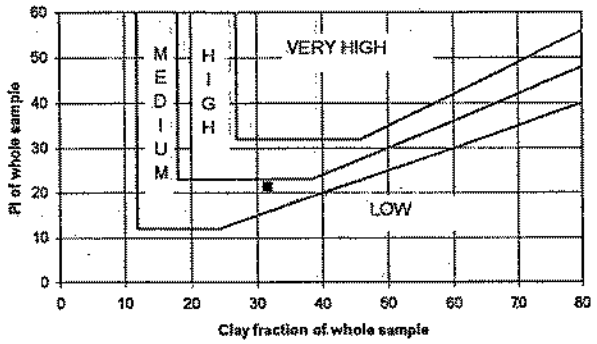
PARTICLE SIZE ANALYSIS

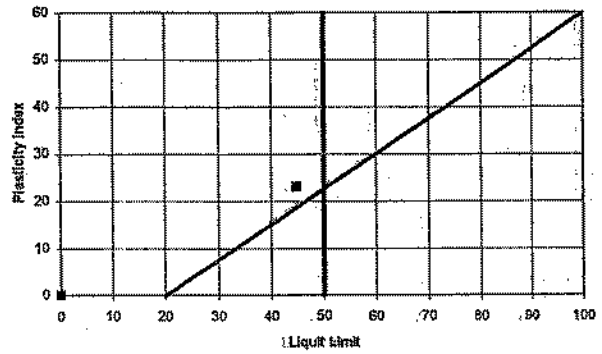
Sample / Hole No.	4608	
Depth (m)	1.0-2.81	
Position	TP 17	
Material Description	DARK Y/O CLAYEY SAND	
Moisture (%)		
SCREEN ANALYSIS (% PASSING)		
63.0 mm	100	
53.0 mm	100	
37.5 mm	100	
26.5 mm	100	
19.0 mm	100	
13.2 mm	100	
4.75 mm	99	
2.00 mm	98	
0.425 mm	93	
0.075 mm	62	
HYDROMETER ANALYSIS		
0.040 mm	45	
0.027 mm	39	
0.013 mm	37	
0.005 mm	37	
0.002 mm	32	
% Clay	32	
% Silt	23	
% Sand	43	
% Gravel	2	
ATTERBERG LIMITS		
Liquid Limit	45	
Plasticity Index	23	
Linear Shrinkage	10.5	
Grading Modulus	0.47	
Classification	A-7-6(11)	
Unified Classification	CL	
Chart Reference	■—■—■	▲—▲—▲

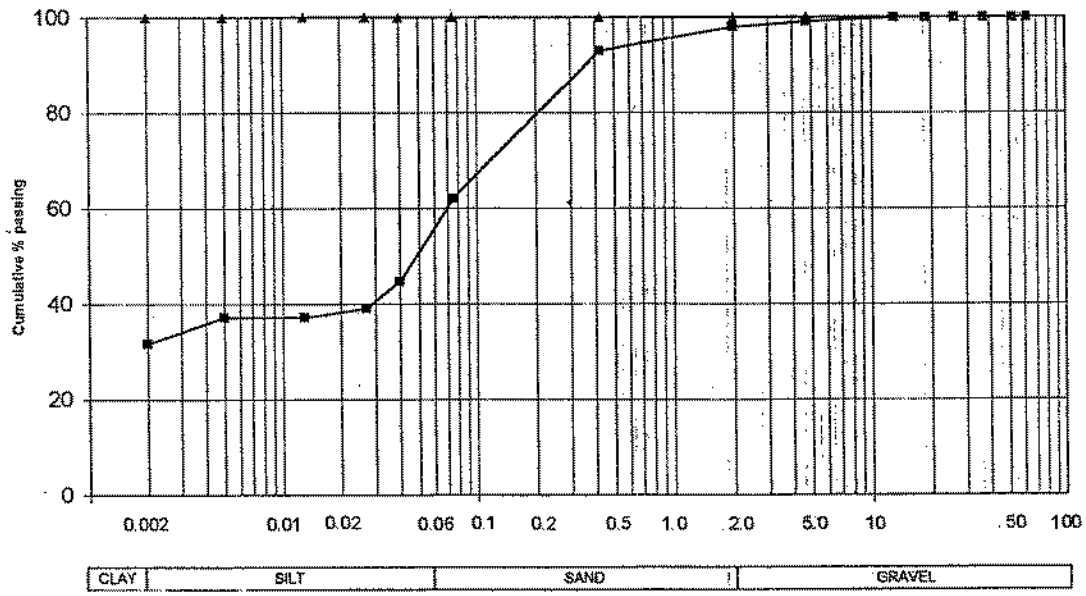
PROJECT : ISCOR FLAT STEEL PRODUCTS - CLAY LINER
JOB NR. : S02-193
DATE : 2002-03-01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





HYDROMETER193-10

Draft for discussion

Confidential and Research Purposes

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